MAY 4, 1953

9.7
3 p2

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

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PROPERTY

DEMAND and SUPPLY BALANCE IN SIGHT

Current average inventories: 40 days for steel, 46 days for aluminum, 40 days for copper—p. 55

✓ LOWER TARIFFS COMING?
Washington Thinks So, p. 65

✓ AUTO BUILDERS ASSEMBLING FRAMES
Costs Less To Ship Components, p. 98

✓ BRAZING AND SOLDERING ZIRCONIUM
Zinc Chloride Dip Is the Key, p. 118

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take a CLOSER LOOK *at*

B&W ALLOY TUBING

for high temperature applications

CARBON-MOLY • CROLOY ½ • CROLOY 1¼
CROLOY 2 • CROLOY 2¼ • CROLOY 3-M • CROLOY 5
CROLOY 5-SI • CROLOY 7 • CROLOY 9-M

All of these intermediate alloys are being used extensively in a wide variety of high temperature applications. All have earned universal acceptance and praise for giving optimum service satisfaction with economy over the years. The accompanying table shows the extensive range of temperature, pressure, corrosion, and oxidation conditions met by B&W Alloy Tubing. Technical data on these analyses is contained in Bulletin TB-6, available upon request. Call on Mr. Tubes—your nearby B&W Tube Representative—to get the benefit of the extensive tubing service he represents, on your specific applications.

CARBON-MOLY—0.50% Mo—For services to 1050F requiring higher creep strength than carbon steel with no increase in corrosion or oxidation resistance.

CROLOY ½—0.60% Cr, 0.50% Mo—For operating conditions to 1075F requiring properties superior to carbon-moly with respect to graphitization and creep strength.

CROLOY 1¼—1.25% Cr, 0.50% Mo, 0.75% Si—Economic grade good creep strength properties up to 1100F. Somewhat more corrosion resistant than chromium-free steels.

CROLOY 2—2% Cr, 0.50% Mo—Economic grade for resisting both oxidation and corrosion, with excellent high-temperature strength, up to 1150F.

CROLOY 2¼—2.25% Cr, 1.00% Mo—Exceptionally high creep strength up to 1175F for polymerization and high pressure cracking. Otherwise similar in properties and characteristics to Croloy 2.

CROLOY 3-M—3% Cr, 0.90% Mo—Somewhat better creep properties, and resistance to corrosion and oxidation up to 1175F than Croloy 2.

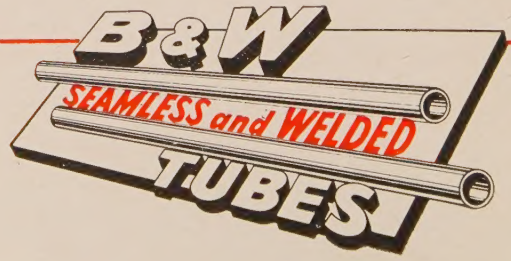
CROLOY 5—5% Cr, 0.50% Mo—For operating conditions up to 1200F where corrosion resistance is a primary requirement—with creep strength and oxidation resistance superior to Croloy 2.

CROLOY 5-Si—5% Cr, 0.50% Mo, 1.50% Si—For operating conditions up to 1300F where oxidation resistance is a primary requirement. Excellent resistance to scaling under straight oxidizing conditions.

CROLOY 7—7% Cr, 0.50% Mo, 0.50-1.00% Si—For operating conditions up to 1250F where corrosion resistance is the primary requirement. Somewhat more oxidation resistant than Croloy 5.

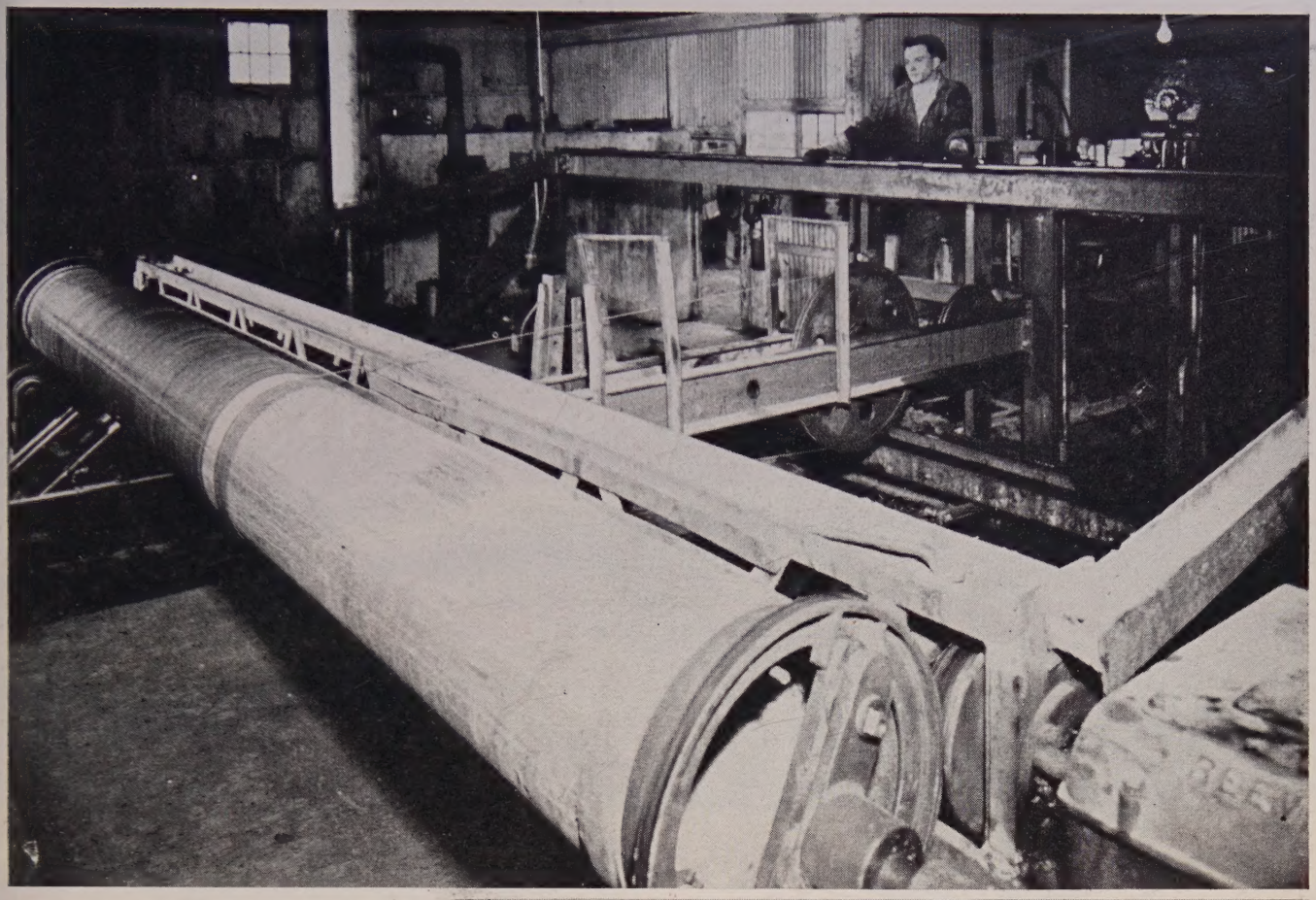
CROLOY 9-M—9% Cr, 1% Mo—For severe operating conditions up to 1300F where high corrosion and oxidation resistance are essential as in hydrogenation processes.

Steels from CROLOY 1¼ upward are electric furnace alloy steels which are normally cleaner and of better quality than open hearth steels. This contributes to greater reliability and improved creep properties at elevated temperatures.



THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

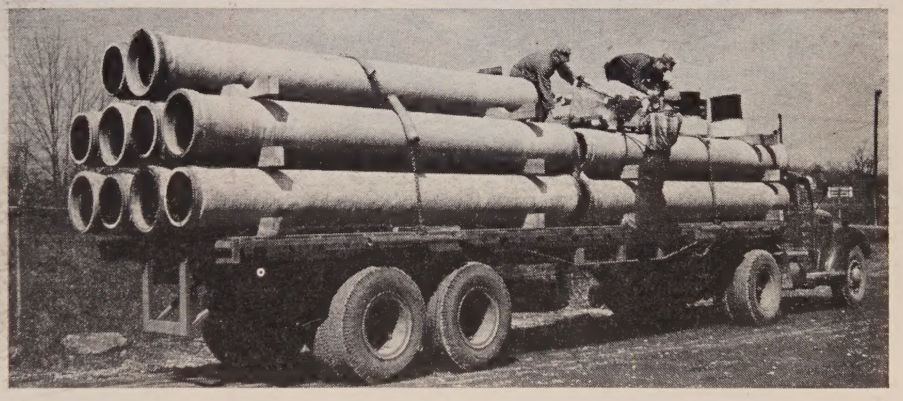
PA-1685 (F)



After a concrete lining is spun centrifugally or poured inside a steel cylinder, Bethlehem high-tensile steel wire is wound around the cylinder.

Coated with rich cement mortar, finished pipes in 16-ft lengths depart for duty. Pre-stressed concrete pipes are made with diameters varying from 16 in. to 48 in.

Photographs courtesy of Lock Joint Pipe Company



BETHLEHEM WIRE GOES UNDERGROUND in Pre-stressed Concrete Pipe

When pre-stressed concrete pipe goes to work steel wire hugs every inch of it, helping to counteract tremendous water pressures.

Wound under high tension by a special machine, Bethlehem wire compresses — or pre-stresses — the steel-and-concrete core. The wire adds tremendously to the strength of the pipe. It permits a lighter weight of finished pipe than could be obtained by using other systems of concrete reinforcement.

Wire for pre-stressed concrete pipe is a Bethlehem specialty. We are continually developing many kinds of steel wire to meet special requirements and new uses. Bethlehem engineers will be glad to contribute their experience to any problems you may have in the selection and processing of steel wire.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

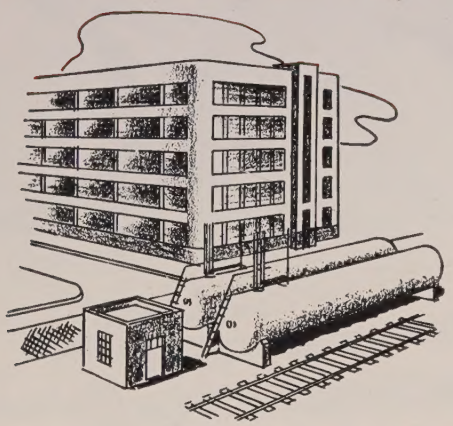
★ BETHLEHEM STEEL ★

Phillips 66

Philgas*

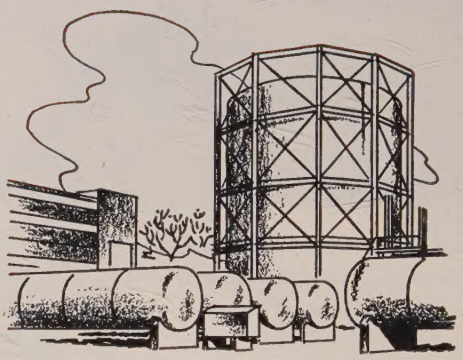
THE ALL-PURPOSE FUEL

For Industries



Philgas, a clean, high-quality LP-Gas, is being used by leading industries for heat treating, mold drying, core baking, ceramic firing and many other operations. Philgas butane-propane systems are automatic, cutting down on overhead while assuring constant furnace temperatures, atmospheres, and pressures.

For Utilities



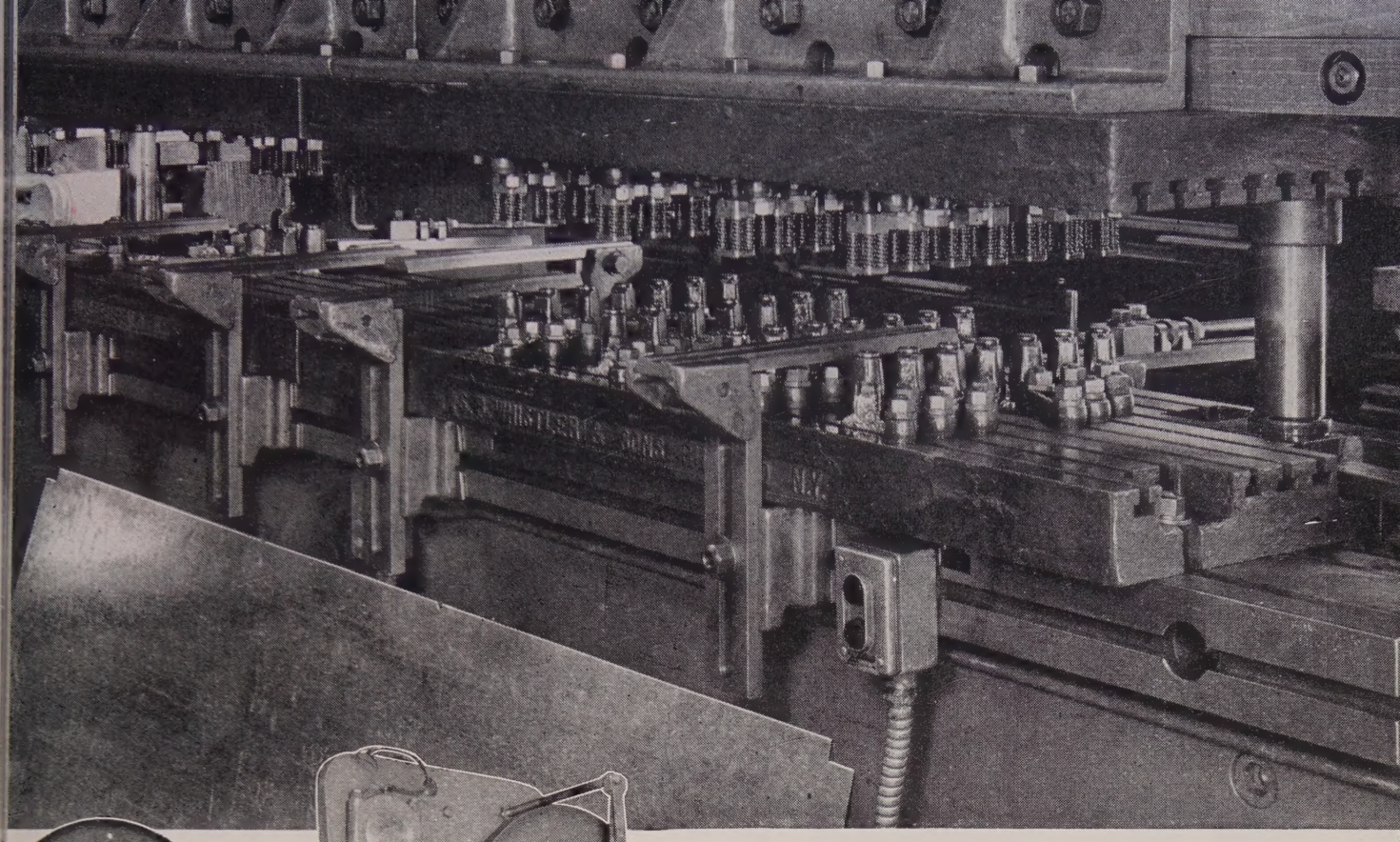
Free from harmful contaminants, Philgas is used by many progressive utilities to augment supplies of natural or manufactured gas. Cleanliness, uniformity, constant pressures (high or low) and easy automatic operation make Philgas a *superior* product. It's America's largest selling brand of LP-Gas.

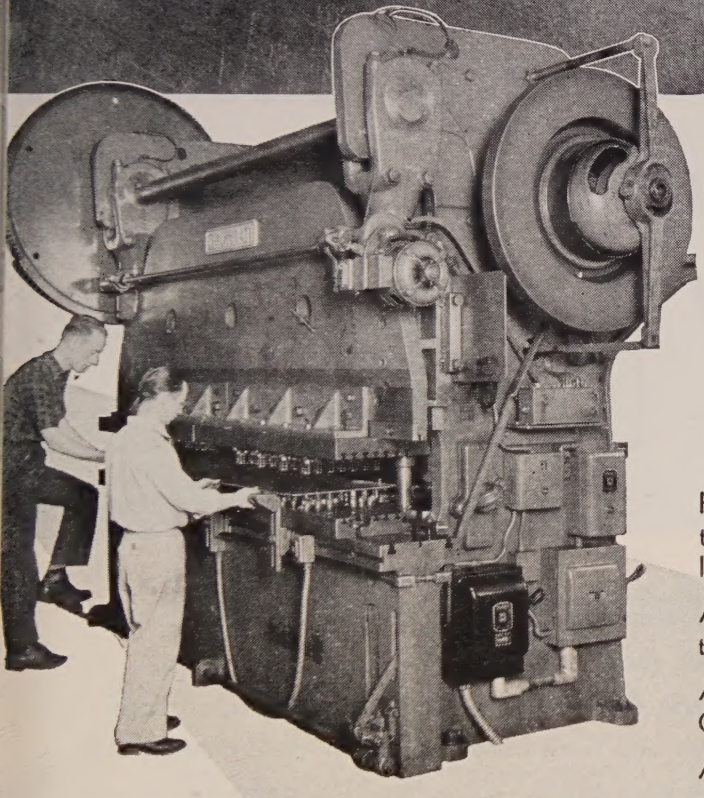
*Phillips *66* and Philgas are the Phillips Petroleum Company trademarks for its high quality propane-butane LP-Gas or bottled gas.

PHILLIPS PETROLEUM COMPANY

Sales Department Bartlesville, Oklahoma

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kan.





● *Courtesy* . . . KIRK & BLUM, Cincinnati, Ohio

72 HOLES

where they belong

Holes must line up—or assembly bogs down. Seventy-two holes are punched in this 10-gauge sheet, accurately located by Cincinnati standard micrometer gauges.

Accurate hole spacing—accurate hole position—are maintained, and assembly is smooth and trouble free.

As production machines, or as machines for jobbing work, Cincinnati Press Brakes are highly profitable.

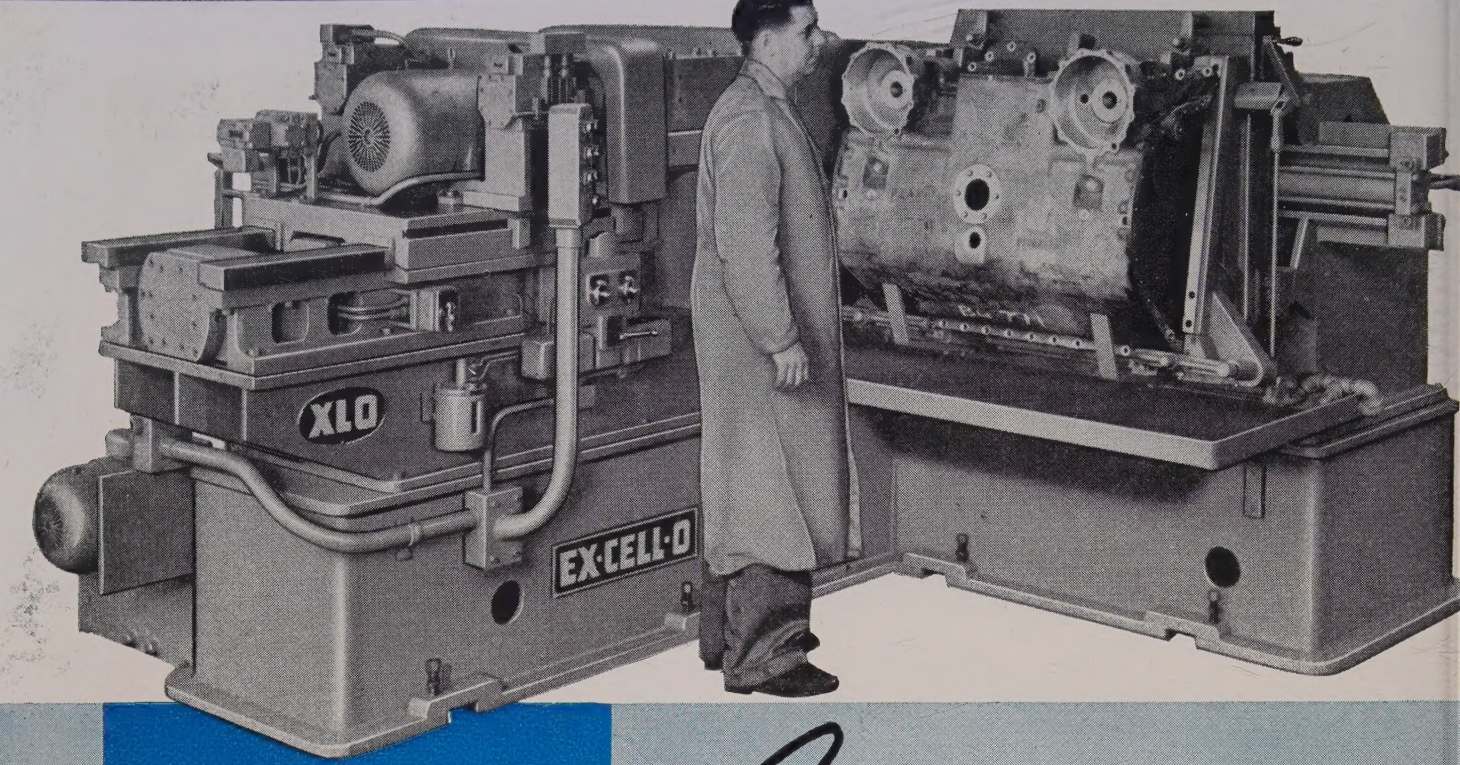
As a press, they offer high production with low investment. As a Press Brake, their low set-up costs, quick change-overs and versatility bring profits.

Write for Catalog B-2A for complete description of the extensive line of Cincinnati Press Brakes, with many illustrations of the diversified uses of these machines.

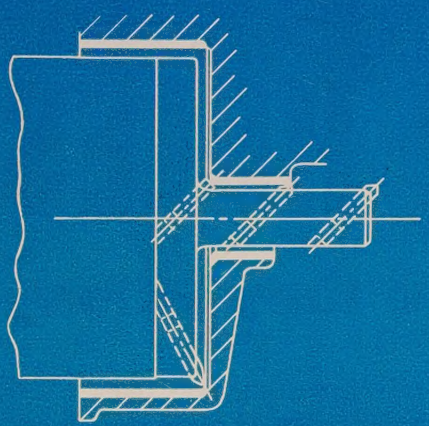
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES



Fixture on this Ex-Cell-O Special Precision Boring Machine indexes between the loading position (shown) and the boring position.



This sketch shows one of the boring heads with tools, and the workpiece with machined surfaces indicated by heavy lines.

Another UNUSUAL PART BORED WITH AN EX-CELL-O *Precision Machine*

The tank transmission housing shown here is cast aluminum, roughly 40″ long, 34″ wide, 14″ deep. Two areas, side-by-side, require identical operations: (1) rough and finish-bore a hole 1¾″ in diameter, and (2) finish-bore a 9¼″ diameter, 3½″ deep. Limits of small bore are plus-or-minus .0005″, with finish free from tool drag back lines.

EX-CELL-O MACHINES ARE PUTTING PRECISION INTO MANY BIG PARTS: cylinder blocks and heads, aircraft crankcases and accessory drive cases, heavy forgings for guns and tanks. For suggestions on machining your parts—large or small—call your Ex-Cell-O representative or write, wire or phone Ex-Cell-O in Detroit today.

53-2

XLO
EX-CELL-O for PRECISION

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS CUTTING TOOLS • RAILROAD PINS AND BUSHINGS DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

This Week in Metalworking

STEEL

Vol. 132 No. 18 May 4, 1953

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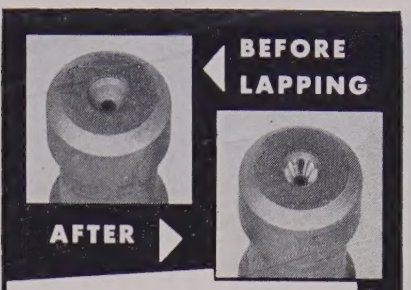
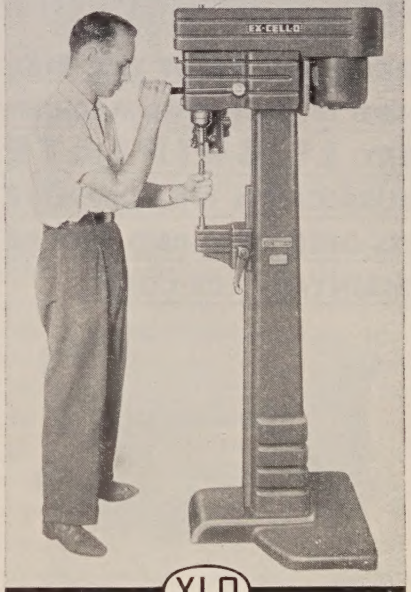


PROBLEM:
To get accurate positioning from female centers.

ANSWER:
LAP THE CENTERS

Ex-Cell-O Center Lapping Machines correct inaccuracies of rough centers, assuring GREATER PRECISION from your present equipment. They are easy to operate. Center Lapping reduces manufacturing costs by minimizing waste from grinding rejection; shortens assembly time because of closer tolerances. All the facts are in Bulletin No. 40271. Write for a copy.



53-28 XLO EX-CELL-O for PRECISION

CENTER LAPPING MACHINES
BY
EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

"IT'S THE GREASE FOR TOUGH OPERATIONS"

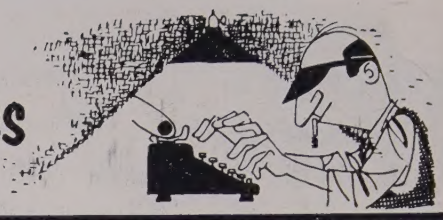
says McCULLOCH MOTORS CORP.
Makers of the famous McCulloch Chain Saws

"We tested all types and makes of lubricants for the Zerol gears in the transmission. The one grease selected for long, tough operation was LUBRIPLATE. Now that we have produced thousands of McCulloch Chain Saws, we more than ever recommend the use of LUBRIPLATE Lubricants in our tools."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

behind the scenes



Meet Al Gray . . .

Dr. Allen Gray, STEEL Technical Editor, likes to tell this story on himself. It seems that one evening when he and the Mrs. were away from home, the telephone rang. The baby sitter who was "minding" little Alice, picked up the phone and said, "Dr. Gray's residence."

An excited voice at the other end shouted "Please tell Dr. Gray to come immediately. There has been an accident and a man needs emergency medical attention."

"I'm sorry," calmly replied the sitter. "I'm afraid you have the wrong number. You see, Dr. Gray's the kind of Dr. that doesn't do anybody any good."

Well, the sitter certainly wasn't speaking for STEEL readers when she made that remark because they'll vouch for the fact that Al Gray's editing of the recent *Specifications Handbook* was one of the most helpful and appreciated jobs ever done by any Doctor . . . medical or philosophical. They know and like also, his fine stories on "Metals in the Jetomic Age", "Corrosion" and "Atomic Energy" all of which have appeared in recent issues.

Al has been a STEEL consulting editor since 1944 and Technical Editor since 1952. He is an authority on the metallurgical and chemical aspects of metalworking and metal-processing.

During World War II, he was on part-time loan from E. I. du Pont de Nemours & Co., Inc. to the Metallurgical Laboratory, University of Chicago, where he directed a group working on metallurgical problems for the Manhattan Atomic Bomb Project. During the war, he was engaged also in work on aircraft bearings. In 1946, he transferred to Du Pont's Electrochemicals Department where he worked in the coatings and corrosion field and exploratory research along chemical-metallurgical lines.

Doc Gray is responsible for a process now used commercially to electropolish stainless steels. When he first became associated with Du Pont Grasselli Chemicals Department in Cleveland 13 years ago, he was active in development of high speed electrolytic tin plating of steel strip.

Gray holds the bachelor of science degree in chemistry and the master of science degree in metallurgy from Vanderbilt University, Nashville, Tenn., where he did research on molybdenum steels. He received the doctor of philosophy degree in physical chemistry from the University of Wisconsin where he worked on tungsten alloys. He has been on the teaching staffs of both the Vanderbilt and Wisconsin chemistry and metallurgy departments.

As a "spare time" effort, Doc Gray is acting in the capacity of editor-in-chief of the book, "Modern Electroplating," sponsored by the Electrochemical Society and scheduled for publication in September, 1953.

Shrdlu's Glossary

Got in on a Re-Orientation Conference the other day at which the bright young boys were tossing off business bromides as if they were something to drink.

Being, in a strictly geometric sense of course, a "square", we jotted down some of the more common cliches. As nearly as we can determine, this is what they mean:

Under Consideration—Never heard of it.

A Conference—A place where conversation is substituted for the dreariness of labor and loneliness of thought.

Re-Orientation—Getting used to work again.

Reliable Source—The guy you just met.

Informed Source—The guy who told the guy you just met.

Unimpeachable Source—The guy who started the rumor originally.

A Clarification—To fill in the background with so many details that the foreground goes underground.

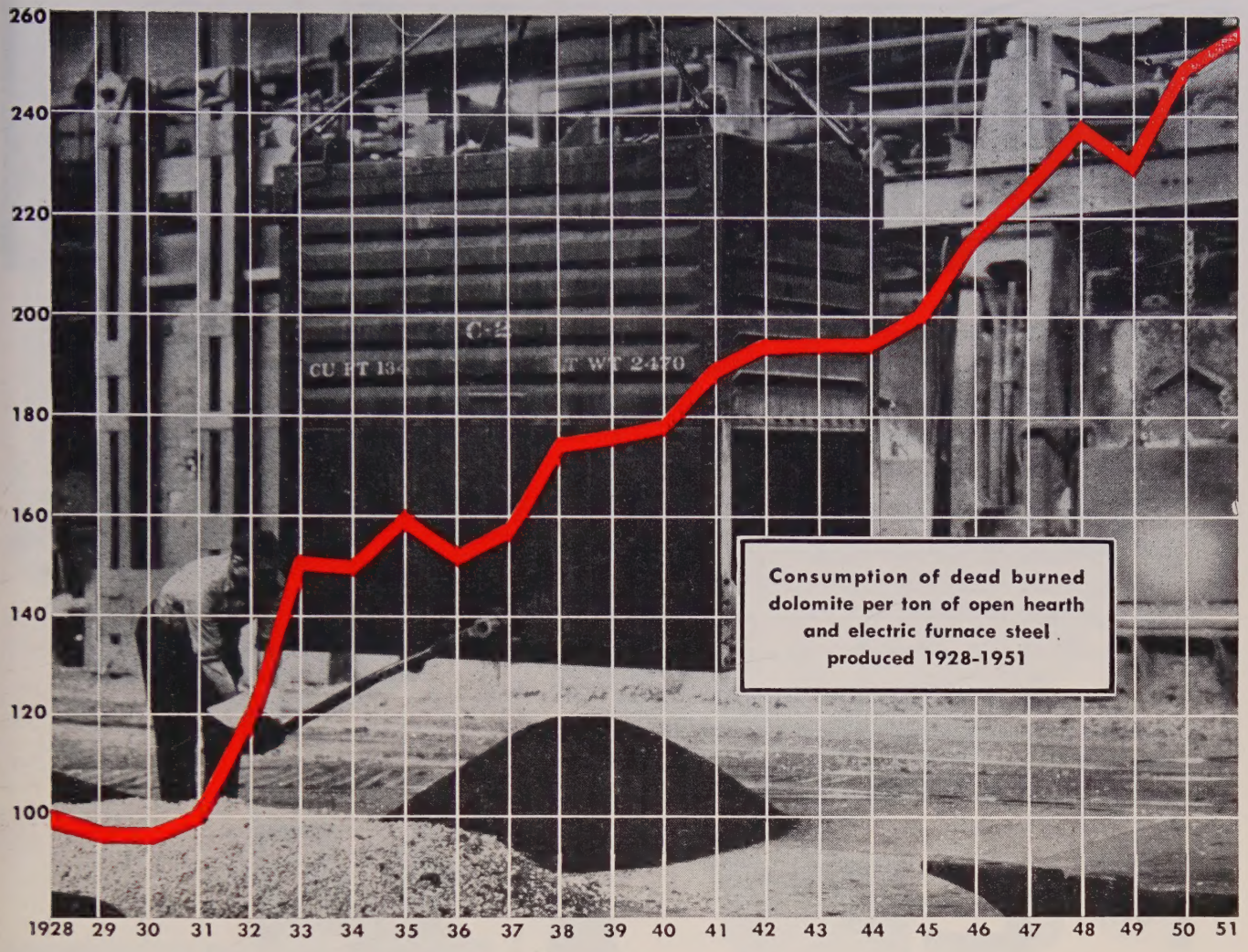
We Are Making a Survey—We need more time to think of an answer.

Note and Initial—Let's spread the responsibility for this.

See Me, or Let's Discuss—Come down to my office, I'm lonesome.

Shrdlu

(Metalworking Outlook Page 47)



calcined dolomite vs. dead burned dolomite

THE price of calcined dolomite approaches that of dead burned dolomite. But in terms of effectiveness as a hearth refractory, calcined dolomite has most of the shortcomings of raw dolomite. However, it lacks the effectiveness of this low priced material for routine drying of bottom.

Calcined dolomite is often called "single burned", just as dead burned dolomite is referred to as "double burned". This outdated nomenclature originated years ago when raw dolomite was first calcined (fired to a temperature high enough to drive off CO_2) and then refired at higher temperatures to obtain dense, thoroughly shrunk granules containing essentially crystalline magnesia and lime.

Calcined dolomite, with a density of 60 to 80 pounds as opposed to 120 pounds per cubic foot for dead burned dolomite, has a high porosity. It reacts rapidly with atmospheric moisture and carbon dioxide. Thus, slaking in transit and storage causes excessive fines. Fines not only pose a dust problem for furnace personnel, but when swept through the furnace by combustion gases, result in damage to all refractories, both below and above floor level.

Lacking density and an integral coalescing agent, calcined dolomite is highly vulnerable to attack during the initial stage of the heat. Calcine thus removed increases slag volume. Magnesia from the calcine leads to viscous slags which take manganese and iron oxides into solid solution, rendering them ineffectual in their important role of refining agents.

Today few steel plants use calcined dolomite. Thus, practice proves the reasoning of science—in increasing consumption of dead burned dolomite.

A pioneer in the manufacture of dead burned dolomite, Basic Refractories Incorporated fulfills its responsibility as a supplier of this essential hearth refractory through a continuing program of product research and quality control and by anticipating, through increased and improved production facilities, the ever expanding requirements of the steel industry for Magnefer and Syndolag.

GRANULAR BASIC REFRACTORIES

Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

Receding Mechanism Guarantees Tapered Pipe Threads To Closest Tolerances . . .

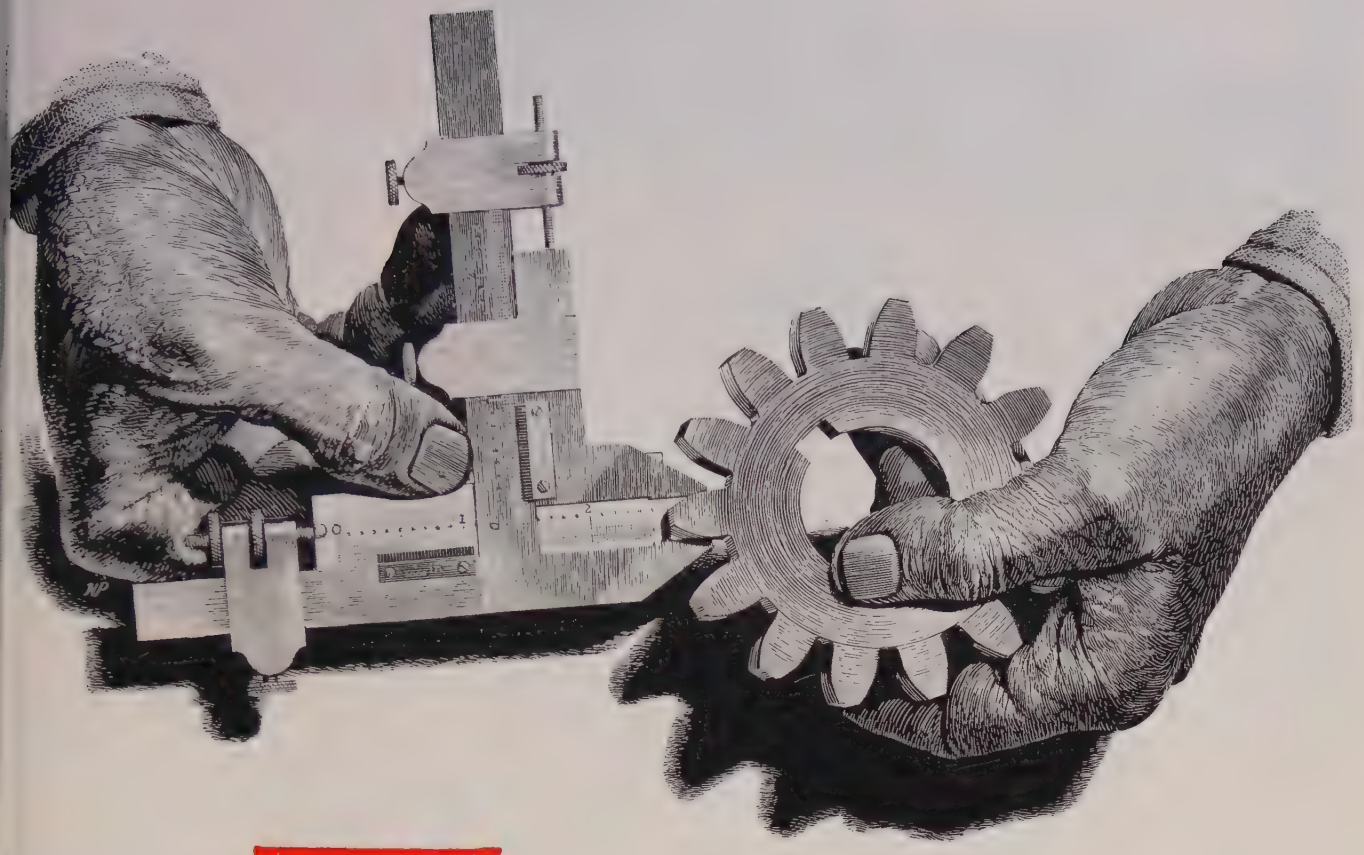
. . . one of the many exclusive features of Landis Receding Chaser Pipe Threading & Cutting Machines. Through this taper attachment the die head is opened on diameter as the thread is being cut, and the thread-cutting chasers recede at a rate equal to the taper of the thread being cut.

This process is actuated and controlled by a sine bar easily and quickly adjusted for various tapers. A tapered pin provides a definite means of setting for 3/16", 3/8", and 3/4" tapers per foot. Thus a straight line taper is guaranteed which is accurate and uniform throughout the entire thread length.

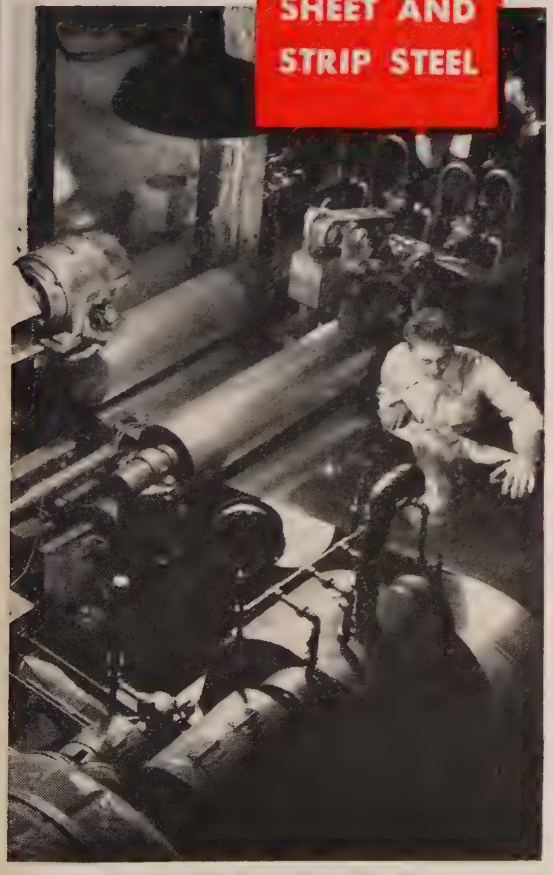
For information on the many other features of Landis Pipe Machines, designed to produce threads to meet the high standards demanded by users of high pressure pipe and oil tubular goods, write for Bulletin C-77.

LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

SEE THESE MACHINES AT OUR EXHIBIT AT THE TULSA OIL SHOW, MAY 14-23—BOOTHS 17 & 18, CALIFORNIA BUILDING



J&L
SHEET AND
STRIP STEEL



Like a precision gear . . .

STEELMAKING, TOO, REQUIRES EXACT MEASUREMENTS

Whatever your requirements for formability, uniformity, or drawing qualities, you'll find J&L Sheet & Strip . . . accurately and faithfully produced to meet your specifications. Complete understanding of the end-use of the sheet or strip you order is a rigid requirement of J&L production. You can depend upon J&L products to fit your production line.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH

J&L STEEL

IN YOUR STEEL FABRICATION
FASTEN IT BETTER...AT LESS COST, WITH NELWELD
Split second stud welding lowers fabrication costs, improves product.
Fast installation of handling accessories that can be easily removed.
Faster installation of brackets or hangers for piping, tubing or conduit.
ARC WELDS STUDS TO STEEL IN A SPLIT-SECOND
AN ELECTRIC ARC WELDING PROCESS

THE NELSON FASTENING ENGINEER WILL SHOW YOU

. . . right in your own plant how your production and your products can be improved with this modern fastening method. Your design and production men can actually participate and test the results on your own products.

For full information on Nelweld as applied to steel fabrication, write the Main Office, Lorain, Ohio.

Fasten it Better . . . at Less Cost, with NELWELD T. M. REG.

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

LETTERS
TO THE EDITORS

Die Shops That Way

Would you be good enough to put us in touch with manufacturers of dies for shallow drawing operations as well as blanking, forming, etc.

G. B. Markle Jr.
president
Cloverleaf-Freeland Corp.
Hazleton, Pa.

• *Being sent is a copy of the Directory of Tool & Die Shops which will give you the opportunity of selecting those shops best located geographically for you.—ED.*

Cutting Fluid Aid Sought

I have just read your article "Cutting Fluids: Their Role in Machining" (Apr. 13, p. 106) and would like to get a couple tear sheets of it. The information may be extremely helpful in some of our machining problems.

C. N. Gebhard
process engineer
Cherry Rivet Division
Townsend Co.
Santa Ana, Calif.

• *Sent—ED.*

Accent on Small Business

In your Nov. 17 issue you had articles entitled "Small Business in Action: Government Relations" (p. 57) and "Small Business: Its Part in Defense" (p. 59). I am doing some research on small business in this country and would appreciate your sending me a copy of these articles.

R. H. Shanaman
technical assistant
to the president
Welsbach Corp.
Philadelphia

• *Sent.—ED.*

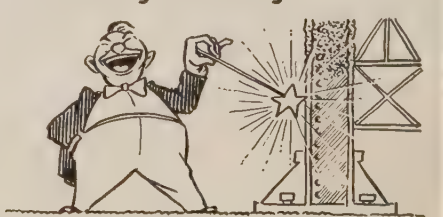
All About Atoms

I would appreciate a copy of your article "The Facts About Atomic Power in Industry" (Mar. 2, p. 86) by Dr. Allen G. Gray.

V. E. Hillman
director of research
Crompton & Knowles Loom Works
Worcester, Mass.

• *Sent.—ED.*

Mollerizing Not Magic



Your article entitled "How You Can Fight Corrosion" (Apr. 6, p. 102) is a splendid presentation of a great industrial problem of which industry is not fully aware. For some time I have been trying to convince steel manufacturers

Please turn to page 12

UP... UP... and OVER

...and Another 110 Tons of Ore are Ready for Stocking

At a large Western Pennsylvania steel mill this Heyl & Patterson Traveling Car Dumper has been efficiently unloading iron ore for the past 10 years.

With the ease of a champion this giant machine raises and empties 110-ton-capacity railroad cars at the rate of 30 per hour.

Designed, fabricated and erected by Heyl & Patterson, this installation reflects the ability of H & P to do the "whole job" from beginning to end . . . from original design to successful operation.

When your problem is concerned with the handling or transportation of ore, coal, slag, limestone or other bulk materials . . . call on Heyl & Patterson, specialists in the design, fabrication and erection of Heavy Bulk Materials Handling Equipment since 1887.

- Ore Bridges
- Railroad Car Dumpers
- High Lift—Turnover—Rotary
- Boat Loaders and Unloaders
- Car Hauls and Boat Movers
- Bradford Breakers
- Pig Iron Casting Machines
- Cyclone Thickeners
- Coal and Coke Handling Equipment
- Coal Crushers
- Coal Storage Bridges

Heyl & Patterson, Inc.

"SINCE 1887"

Heavy Bulk Materials Handling Equipment

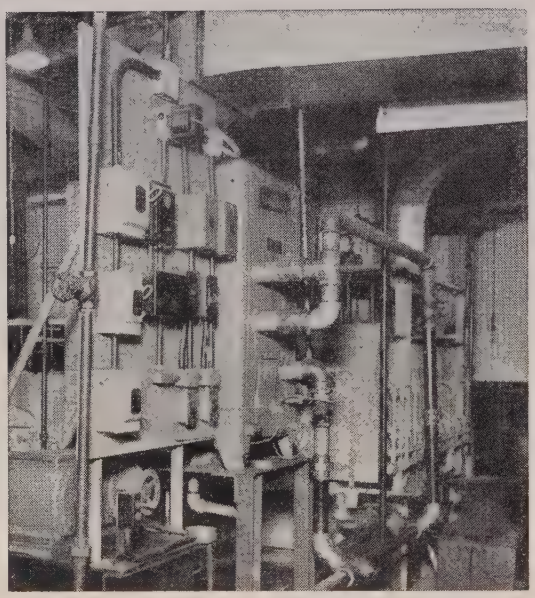
All The Way from Design to Erection

55 WATER STREET · PITTSBURGH 22, PA.

Improve Quenching and You Get Better Heat Treating

Your Department can have a better arrangement with Niagara Equipment that saves much space and increases your production.

This quench bath cooler gives you control of temperature and pays for itself quickly with water savings



● The NIAGARA AERO HEAT EXCHANGER transfers the heat from the quench bath to atmospheric air by evaporative cooling. It never fails to remove the heat at the rate of input, giving you real control of the quench bath temperature. This prevents flashing of oil quenches. In all cases it improves physical properties, saves loss of your product from rejections and gives you faster production, increasing your heat treating capacity. You can put heat back into the quench bath to save the losses of a "warm-up" period.

Savings in piping, pumping and power as well as great savings in cooling water return the cost of the equipment to you in a short time. The Niagara Aero Heat Exchanger saves nearly all of the water consumed by conventional cooling methods.

For the complete story of other benefits and savings, write for Bulletin 96.

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced District Engineers in all Principal Cities of U. S. and Canada

LETTERS

Concluded from page 10

of the advantages of mollerizing steel against corrosion. Because of our method, structural steel could be coated with aluminum. If so coated, it would never have to be painted other than for aesthetic reasons. A bridge could be built completely out of mollerized members. These members could be bright dipped and chemically oxidized so that no unsightly salts of white corrosion would appear. In fact, there is no steel product that could not be mollerized. The cost is relatively small considering the tremendous maintenance expense which goes on indefinitely when trying to protect structural steel with paint or other covering.

It is no problem to build electric salt bath furnaces deep enough or large enough to handle any size steel members. If it were necessary to coat these members by having tremendous containers with only molten aluminum, then it would not be feasible. But with our method the entire heating of the material to be coated is done in the salt bath and the coating takes place by passing through a relatively thin layer of aluminum floating on top of the salt.

In addition to structural members, pipe, wire, strip, steel, etc., can also be coated. Pure aluminum can be used which gives us the greatest corrosion protection under most conditions.

This is one practical solution to some corrosion problems.

H. E. Linden
president
American Mollerizing Corp.
Beverly Hills, Calif

Specifically About Finishes

We shall appreciate receiving 12 reprints of your article "How You Can Specify Surface Finishes" (Jan. 19, p. 74).

Erwin B. Philips
chairman of the board
Philips & Davies Inc.
Kenton, O

Please send us 6 tear sheets . . .

W. I. McInerney
superintendent, H. T. & C. D. Depts.
Pittsburgh Crucible Division
Crucible Steel Co. of America
Midland, Pa

Although we receive two copies of STEEL one of our officials would like to obtain another set of tear sheets . . .

L. H. Schaut
purchasing agent
Keystone Carbon Co. Inc
St. Marys, Pa

We'd like to obtain 30 copies of this article . . .

D. G. Schaff
manager
Syracuse Bearing Co.
Syracuse, N. Y

● *Sent.—ED.*

Shell Shortage Story

In your Apr. 6 issue of STEEL is an excellent article entitled "Blasting Away at the Shell Shortage" (p. 64). May we have permission to reprint this article complete in our employee magazine the *Keystone?*

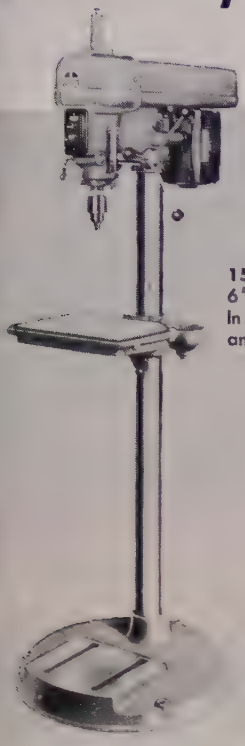
L. L. Stoffel
Lehigh Foundries Inc
Easton, Pa

● *Permission granted.—ED.*

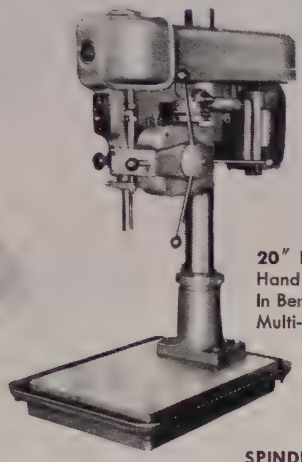
Whatever your metal-cutting or woodworking requirements...

There's a WALKER-TURNER LIGHT-HEAVYWEIGHT Machine

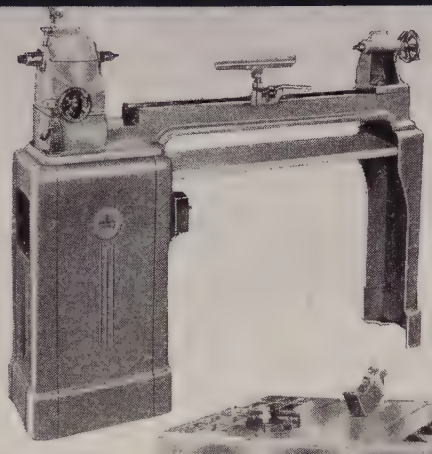
designed to do the job faster, at lower investment cost



15" DRILL PRESSES
6" or 4" Spindle Travel
In Bench, Floor (shown)
and Multi-Spindle Models

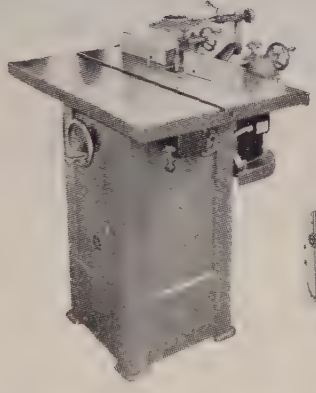


20" DRILL PRESSES
Hand or Power Feed
In Bench (shown) Floor and
Multi-Spindle Models

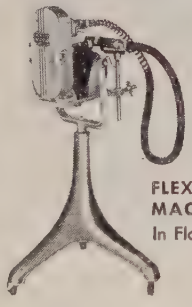


VARIABLE SPEED LATHES

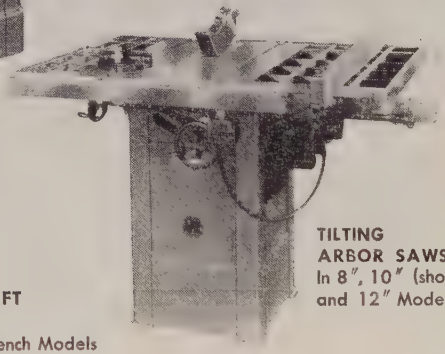
RADIAL DRILLS



SPINDLE SHAPERS 1 h.p.

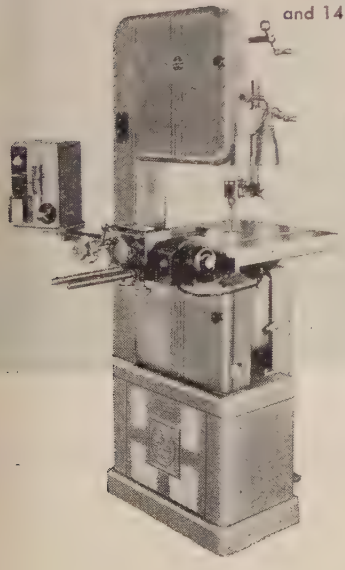


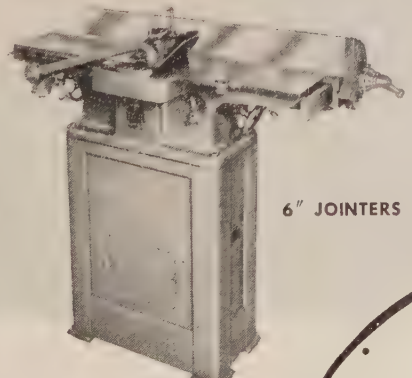
FLEXIBLE SHAFT MACHINES
In Floor and Bench Models



TILTING ARBOR SAWS
In 8", 10" (shown)
and 12" Models

BAND SAWS
Metal and wood-cutting
16" (shown)
and 14" Models





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to write for full details and specifications
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Dept. S-5, Plainfield, N. J.
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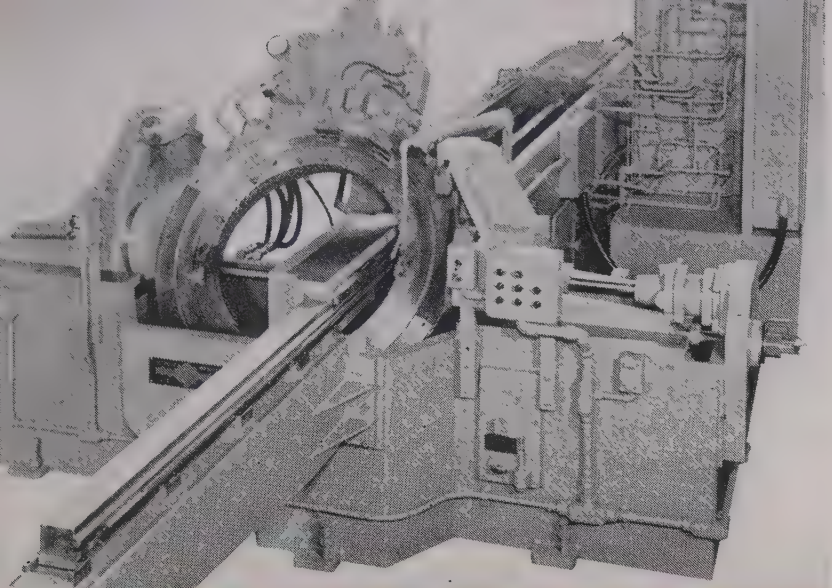
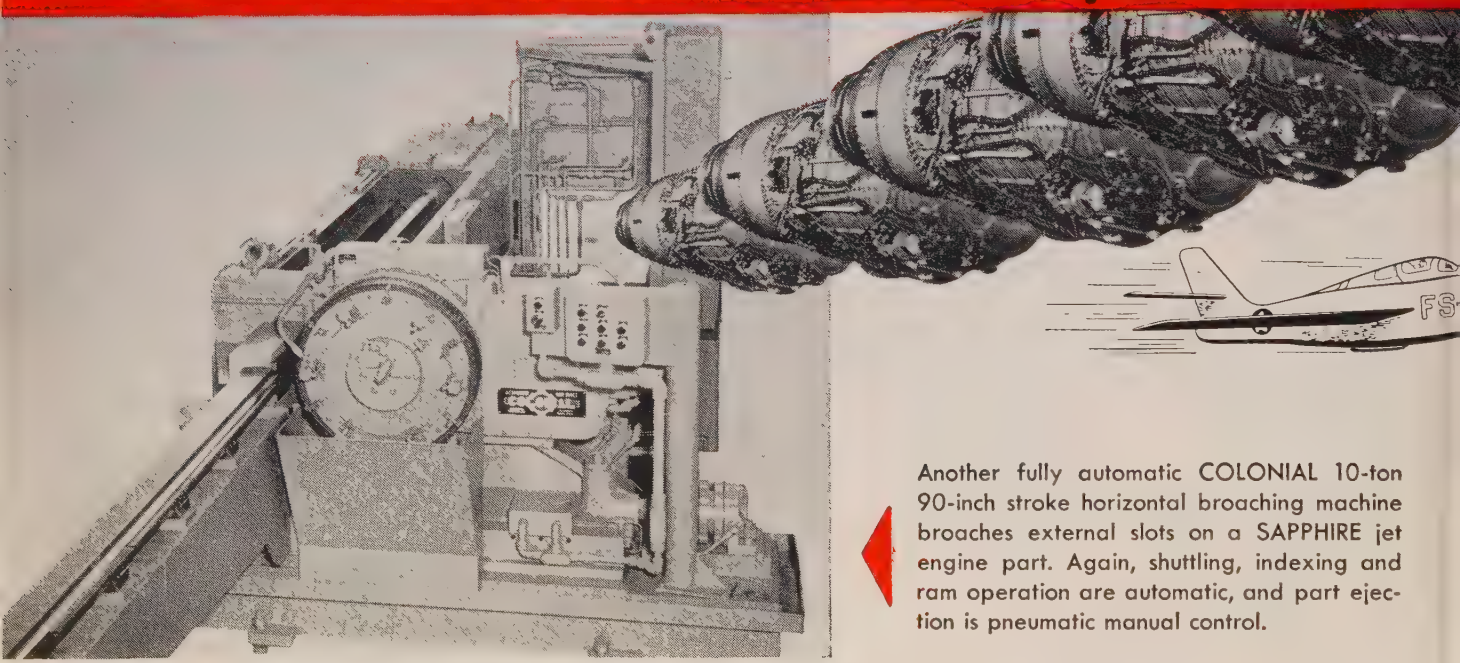
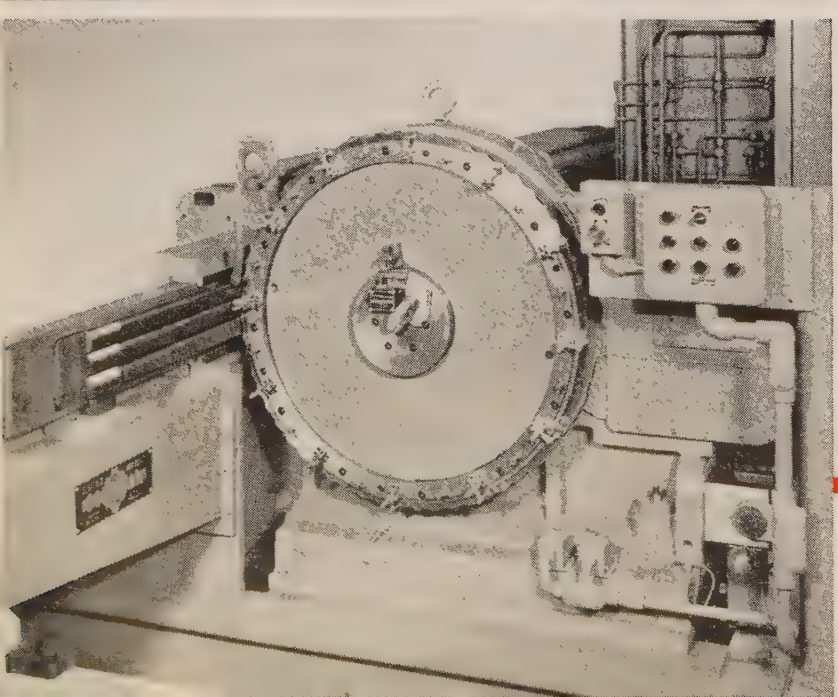


COLONIAL broaching machine, 10-ton 90-inch stroke horizontal, with trunnion fixture for angular adjustment. Shuttling, indexing, ram operation, and rapid return fully automatic, for broaching internal slots on Curtiss-Wright SAPPHIRE ring segments. Pneumatic part ejection manual control.

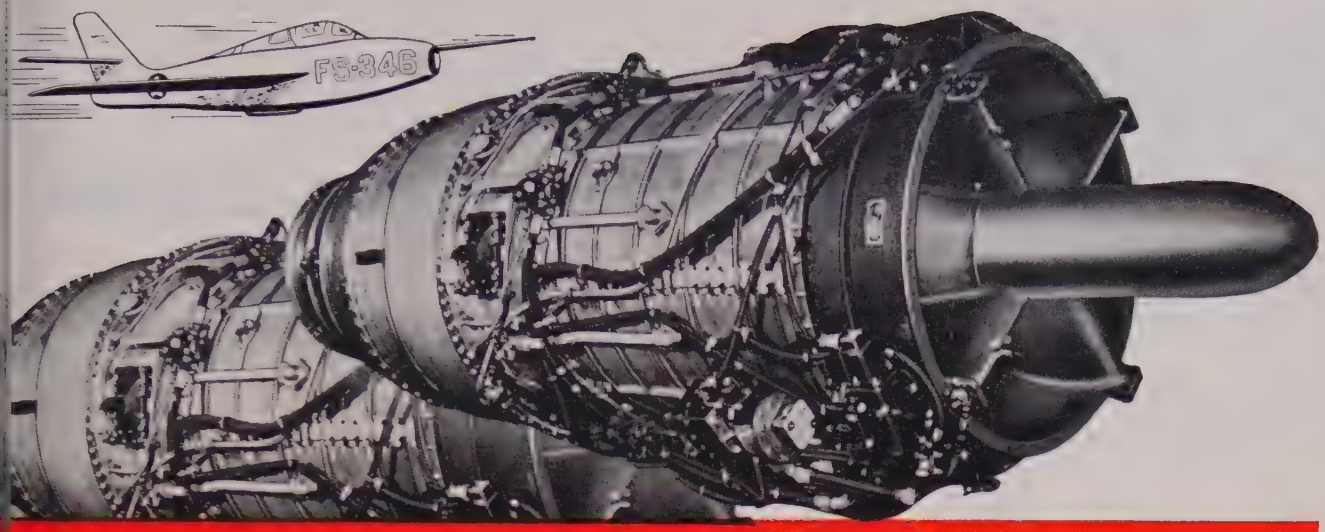
COLONIALS *in the Shop* MEAN



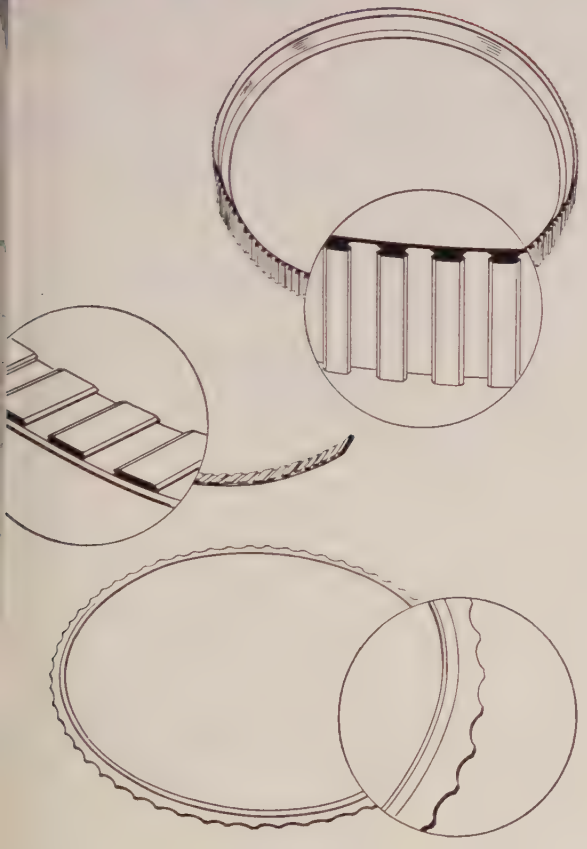
Another fully automatic COLONIAL 10-ton 90-inch stroke horizontal broaching machine broaches external slots on a SAPPHIRE jet engine part. Again, shuttling, indexing and ram operation are automatic, and part ejection is pneumatic manual control.



Three external scallops on this Curtiss-Wright SAPPHIRE part are broached automatically with each stroke of the ram, on this 10-ton 60-inch stroke COLONIAL broaching machine. Like the other machines shown, electrical controls permit individual operation of each function for set-up and tryout purposes.



MORE CURTISS-WRIGHT SAPPHIRES *in the Air*



se drawings, distorted for security reasons, indi-
e the types of jet engine parts being produced auto-
ically today on COLONIAL broaching machines
n 'unified' broaching.

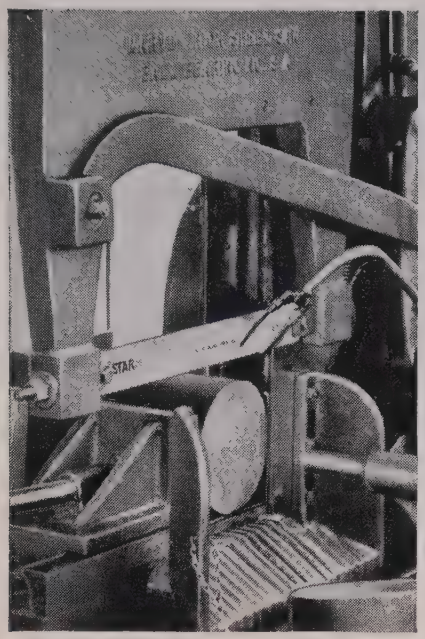
COLONIAL BROACH is proud to be a supplier of broaching machines to the Curtiss-Wright Sapphire jet engine program. This 25% more powerful jet fighter engine has gone into production in record breaking time, and record breaking production will be possible due to the high production accuracy of machine tools like the fleet of automatic Colonial broaching machines, complete with Colonial broaches and fixtures, working on this program.

"Always ready for flight" is the reputation established by SAPPHIRES at the Air Force's principal flight test base. "Always ready for broaching" is the reputation established by COLONIALS in leading production shops of America. This reputation can be traced to Colonial's 'unified' broaching, made possible by designing and producing the broaching machine, the broaches, the fixtures, and the automation, all in Colonial's own plant, and all serviced by Colonial in the production shop.

PIONEERS OF H.S.S. BROACHING

COLONIAL

BROACH CO. DETROIT 13



best metal cutter...
real cost cutter...

STAR "Moly"®

High Speed POWER Hacksaw Blades

To cut your initial power hacksaw blade costs at least 15%, tell your Distributor you want STAR "Moly" High Speed Power Blades.

STAR "Moly" Blades give you an extra dividend, too—cutting that's been proved faster and more efficient.

Over the years, *quality* above all has made STAR Blades industry's *preferred* blade—top quality steel, carefully heat treated, manufactured on specially designed equipment, to give you fast, economical cutting and long blade life.

FAST, LOCAL SERVICE from your STAR Distributor's Stock

STAR "Moly" Blades are sold only through recognized Distributors—the men you know and have confidence in, the men who have inventories on hand to give you fast delivery where and when you want it. It is wise to buy whatever you can from your recognized Distributor.

1832

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MIDDLETOWN, N. Y., U.S.A.
Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saw Blades and Clemson Lawn Machines.

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The Weekly Magazine of Metalworking

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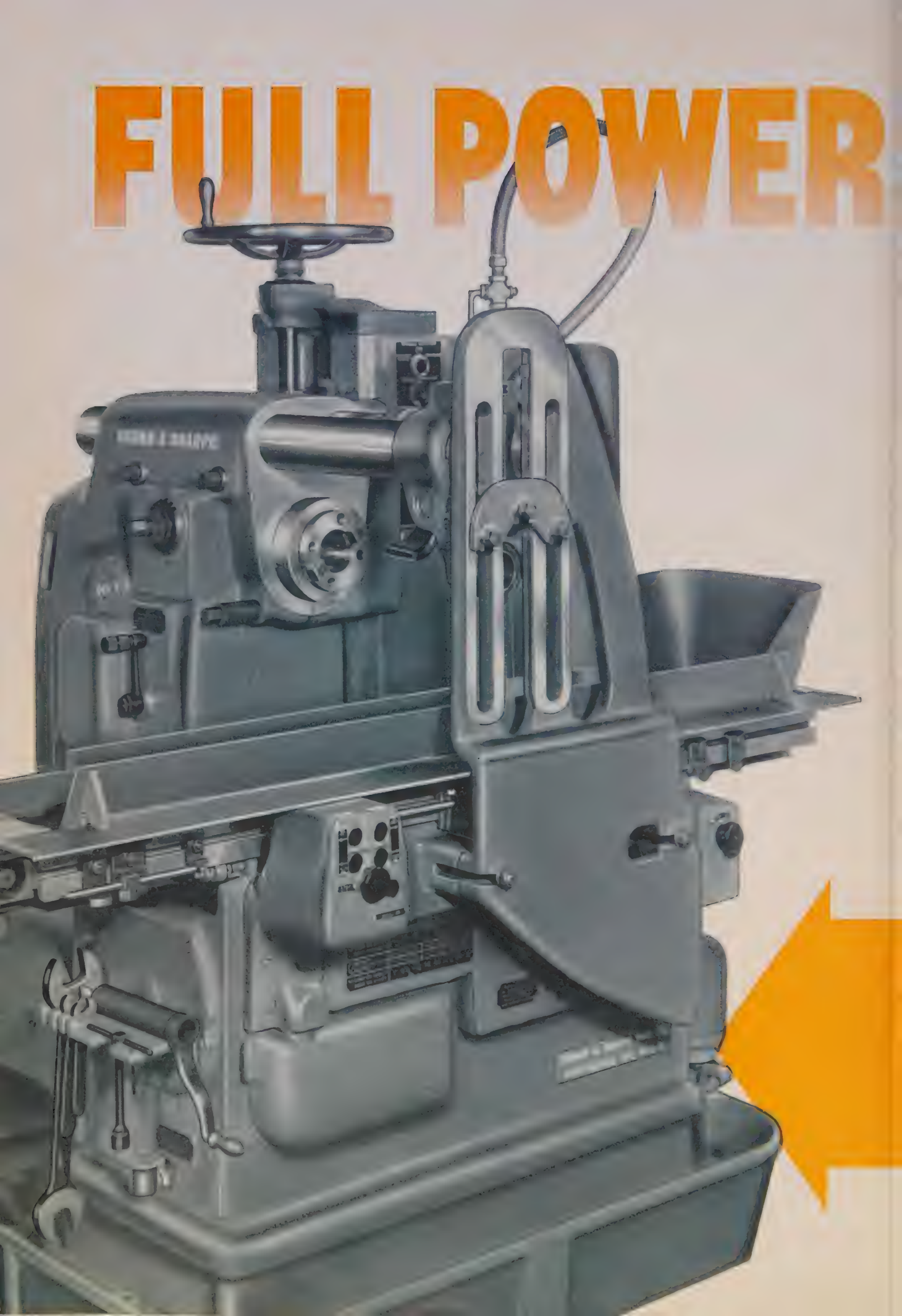
POWERFUL

No. 12 manufacturing type milling machine

Brown & Sharpe

FULL POWER

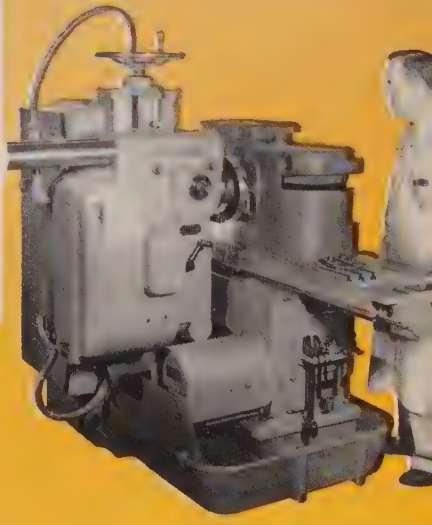


. . 7½ h.p. at the spindle for extra fast milling on long and short run jobs

Through extra power and simplified operation, this machine gives you important competitive advantages for meeting today's high production schedules.

It allows you to take heavy cuts at fast feeds on a wide variety of medium sized work . . . quick set-ups are assured by many time-saving features. All power movements are electrically controlled giving you exceptionally precise, rapid operation. Dual feed rates, a variety of automatic cycles, and the ability to climb mill in either direction are just a few of its advanced conveniences. Maximum cutting efficiency is assured through a wide choice of feeds and speeds. Write for complete details on the powerful No. 12 Plain Milling Machine — 7½ H.P. Spindle Drive.

POWERFUL CUT being made on a No. 12, 7 ½ h.p. Milling Machine. Steel forging is 5" wide and cutter removes ¼" of stock at a fast feed. Unique high ratio gearing makes faster cutting possible.

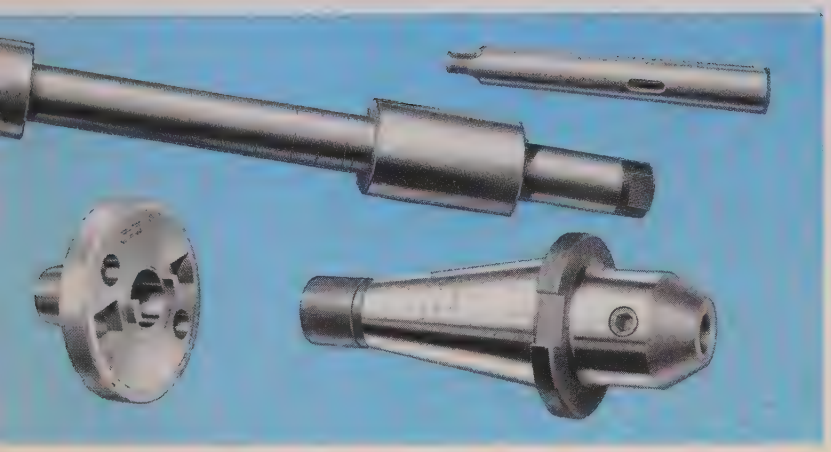


HIGH SPEED MILLING of casting using carbide-tipped face milling cutter. The powerful No. 12 permits taking full advantage of the faster feeds and speeds possible on medium-sized carbide milling jobs.

SPECIAL FIXTURES, like this for automatically indexing and milling squares on taps, make the No. 12 a still higher production machine . . . removal of fixture quickly converts machine for general use. Brown & Sharpe Engineering Service and Facilities are available to you for special applications.

Brown & Sharpe

Keep Milling Efficiency High with these productioneered tools



ARBORS, ADAPTERS, and COLLETS

These arbors, adapters, and collets are made with the same precise care for which other Brown & Sharpe products are famous. Their strength and accurately ground surfaces insure highly efficient milling on all jobs.

CUTTERS and END MILLS

Brown & Sharpe cutters give you full value for every dollar invested in them. That's why more buyers prefer them. They're made from the finest steels, under scientifically controlled conditions, to assure your complete satisfaction.

VISES

Low in height and rigidly constructed, these precision vises give you maximum work-holding economy. When fitted with special jaws, they often eliminate the need for expensive fixtures.

WRITE FOR COMPLETE INFORMATION ON ANY OF THE ABOVE PRODUCTS. BUY THROUGH YOUR LOCAL DISTRIBUTOR.

Brown & Sharpe

Milling Machines • Grinding Machines • Screw Machines • Cutters • Machine Tool Accessories
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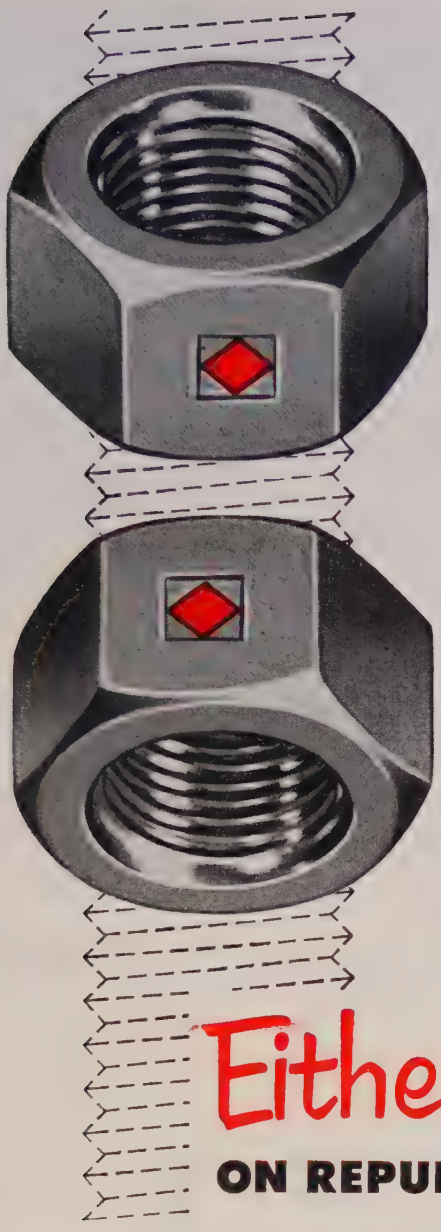


Either end is "UP"

ON REPUBLIC UPSON "NYLOK" NUTS

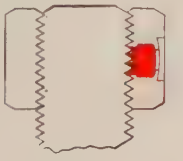
Here's an advantage that saves you man-hours and trouble on your assembly lines . . . no need to turn a Republic Upson "Nylok" Lock Nut end-for-end to get it right-side up. Screw them on either way . . . they go on easily, *stay* put even under severe vibration, and come off easily when you want them off. Ready to *re*-use, too.

Tell us the sizes you are interested in . . . we'll send samples of Republic Upson "Nylok" Nuts . . . the lock nut with the nylon pressure plug.

Light series tapped ¼" thru ¾"
Light thick series tapped ¼" thru ½"
Regular sizes tapped ¼" thru ½"
Heavy series tapped ¼" thru ½"

12 WAYS BETTER

Assemble from either end	No special tools
Can be re-used	One piece
Non-galling	Ideal for mechanical feeding
Best wrenching characteristics	No lubricant needed
Won't damage threads	Cold-forged
No special know-how	Lock in any position



Here's how the "Nylok" principle works

A nylon plug inserted in one of the sides of the cold-forged nut forces the nut tightly against the opposite threads as the nut is turned on.

*U.S. Pat. No. 2,462,603 and pending applications

REPUBLIC STEEL CORPORATION
Bolt and Nut Division • CLEVELAND 13, OHIO
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REPUBLIC STEEL
UPSON QUALITY **BOLTS AND NUTS**

Secret of a split-second click!

SET your camera for the split-second timing you want. Flick the exposure lever. Click! That's it!

A tiny spring of music wire, as small as .006″ in diameter, makes this possible. It momentarily stores the power of your flick, then releases this power, precisely controlled, to click the shutter. Chances are your own camera has a shutter spring much like one of those shown above. Chances are, too, that it is formed of wire from National-Standard's Worcester Wire Works Division, for here special music wire is produced continually for America's leading camera makers.

Camera makers are particular people. To give you equipment with lifetime reliability, to give you *good* pictures, even the wire for such tiny springs must be the finest of its kind . . . a job for experts. Imagine the painstaking care, the highly developed techniques necessary to produce this fine wire with its essential uniformity, high tensile strength, temper and perfect finish.

Music wire in its various types and sizes has an infinite number of uses, but is only one of many special kinds of wire produced at Worcester Wire Works. If *you* have a need for special-purpose wire, Worcester Wire Works specialists, as always, welcome the chance to show you what cooperation really means.

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

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NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

Here's How the Gisholt

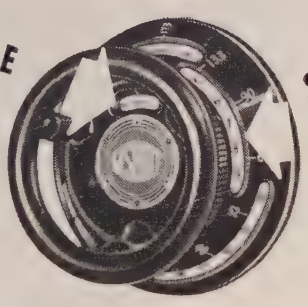
HYDRAULIC SPEED SELECTOR

saves you time and money

GISHOLT

SET CUTTING SPEED HERE

There is a "best" cutting speed for machining with every combination of material and tool. Set that cutting speed here by turning the knurled ring.



SELECT DIAMETERS HERE

The operator merely turns the handwheel to the diameter of each successive cut. The Selector automatically shifts to the proper spindle speed.

Instant shifts to any one of 12 spindle speeds make it easy for the operator always to use the most efficient cutting speed. Reduces cutting time to a minimum with no time-wasting calculations and no physical effort.

Actuated by a mere touch to the wheel, the Speed Selector functions automatically, leaving the operator free to index the turret and present new tools to the work, thus reducing waste time between cuts. It's one of many features on Gisholt Turret Lathes that pay for themselves in a hurry.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

DRAVO
split-type crane cab cooler reduces cab temperatures 65°F at J&L

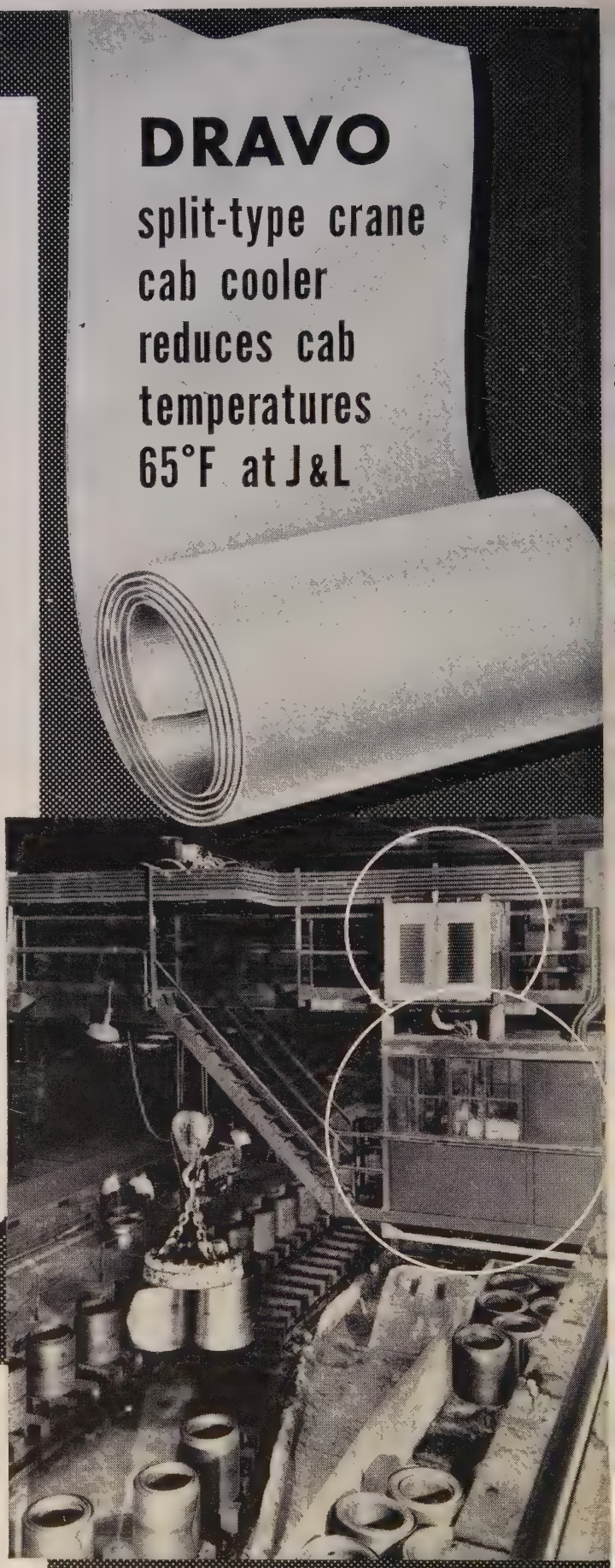
Crane operators working with hot coils of sheet steel at Jones & Laughlin Steel Corporation's Cleveland Works were subjected to ambient temperatures of 150°F . . . until a Dravo Split-Type Crane Cab Cooler was installed on the crane.

Now temperatures inside the cab have been reduced to 80-85°F, providing crane operators with healthier working conditions, making them more efficient and alert and reducing the possibility of accidents.

Because of the limited space available on the crane, the condensing section was mounted on the bridge and the evaporator section was placed in the cab itself. The two sections are joined by refrigerant piping, eliminating the need for a bulky duct system.

Dravo Crane Cab Coolers filter the air, remove dust, dirt and fumes; provide heat in winter, cool air in summer, and constant ventilation the year around. They are easily and quickly installed on any type crane with a minimum of crane down-time required.

Dravo Crane Cab Coolers are available now in both split-type and self-contained units. Write for more information—or call the nearest Dravo Office and have our representative call on you. Ask for Bulletin No. QX 1301-576.



DRAVO
CORPORATION
Air Conditioning Department
Dravo Building, Fifth and Liberty Avenues
Pittsburgh 22, Penna.

ATLANTA • BOSTON • CHICAGO • CINCINNATI
CLEVELAND • DETROIT • INDIANAPOLIS • NEW YORK
PHILADELPHIA • PITTSBURGH • ST LOUIS • WASHINGTON

Get cleaner threads, tighter joints

with Buckeye Conduit!"

AN ELECTRICIAN TALKS ABOUT CONDUIT: "I agree with other electricians that "Buckeye" gives a clean and strong thread. A clean thread is essential for making a really tight, safe joint! Youngstown rigid steel conduit is tops."

ELECTRICAL ENGINEER ENDORSES BUCKEYE CONDUIT: "As an electrical engineer, I have jobs which demand wiring which must withstand vibrations and shock. By specifying "Buckeye" I protect these wires because only good steel produces threads strong enough to make tight and safe joints."

Youngstown makes rigid electrical conduit from start to finish. This enables Youngstown to control the complete manufacturing process which insures that each length of "Buckeye" is made of topgrade steel. Since only high quality steel produces a clean, strong thread, it's no wonder that "Buckeye" is a favorite in the industry. On your next job, be sure to specify Youngstown Buckeye conduit.

Shipments of Buckeye rigid steel conduit are now being made from our conduit mills at Indiana Harbor and Youngstown.

QUALITY V YOUNGSTOWN SERVICE

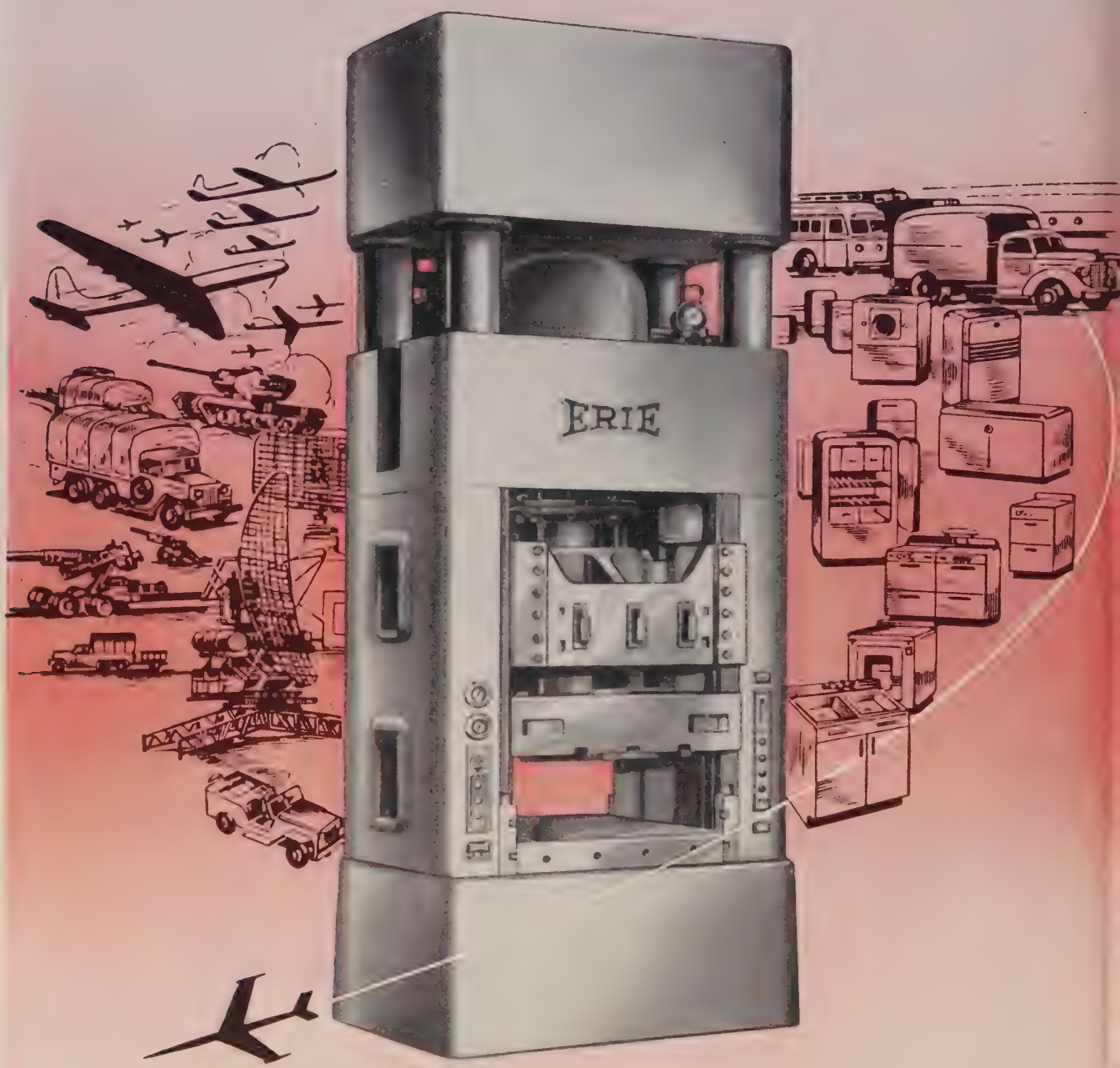
THE YOUNGSTOWN SHEET AND TUBE COMPANY General Offices — Youngstown 1, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel Export Office-500 Fifth Avenue, New York

COLD FINISHED CARBON AND ALLOY BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

ERIE

Hydraulic Metal Forming Presses Make Better Products for Commercial or Defense Use...



WHETHER the bulk of your formed metal production is for "guns" or "butter" or a combination of both, it will pay you to consult with our designers and engineers on metal forming equipment. More than a half century of experience stands back of our recommendation. Write for complete details.

ERIE FOUNDRY COMPANY ERIE, PENNSYLVANIA

ERIE

Dependable FORGING HAMMERS • HYDRAULIC PRESSES

IN VAPOR DEGREASING

WHEN SO MUCH

DEPENDS ON A QUALITY SOLVENT

IT PAYS TO SPECIFY

SPEEDY, DEPENDABLE...

"TRICLENE" D Trichlorethylene is the result of over 20 years of research and practical experience in the degreasing field. Made under carefully controlled conditions by the pioneer manufacturer of degreasing solvents in the U. S., each shipment of "Triclene" D is carefully pretested for stability and purity... must meet test standards higher than those established by military and federal specifications (MIL-7003 and O-T-634). Yet "Triclene" D costs no more than other leading brands of degreasing solvents.

"Triclene" D is available nationally in 55 gallon drums and tank cars of various sizes. Distribution points in over 100 principal cities are ready to serve you with prompt deliveries. And trained Du Pont technical representatives with broad experience in the field will be happy to work closely with you in keeping your degreasing installations operating at peak efficiency.

E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Wilmington 98, Delaware.

Send for your copy of "Vapor Degreasing with Du Pont Non-Flammable Solvents." It shows you how and where "Triclene" D can be used to save time and cut costs in metal cleaning.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Delaware

Please send me detailed information on Vapor Degreasing: applications, advantages, equipment used . . . and more facts on Du Pont "Triclene" D. We are interested in cleaning____products.

*Name*_____ *Position*_____

*Firm*_____

*Street & No.*_____

*City*_____ *State*_____

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

"Most profitable turning investment we have ever made"

● This is the enthusiastic approval given the Warner & Swasey 1 AC Single Spindle Automatic by H. C. Stebbins, President of Cloyes Gear Works Inc. Timing gear specialists to the automotive industry for 30 years, his 50-man shop was faced with the necessity of expanding operations—without costly building construction—in the face of today's tight manpower situation.

The Warner & Swasey 1 AC answered this complex problem. Using the same floor space, production has been doubled on jobs previously done on hand-operated machines. And scarce machine operators have been released for other important jobs in the plant.

Charles Laslo, Plant Superintendent, reports that he finds the 1 AC adaptable to more and more jobs. And setup is quick—requiring no more time than was necessary for hand operated machines. In fact, it has been found profitable to set up for as few as 100 pieces—most unusual for an automatic machine. The 1 AC's over-all greater accuracy has improved the finished product, and limits of one-thousandth of an inch on bores have been maintained.

So before you make any additional investments in machine tools—or in additional building construction—first call in your nearest Warner & Swasey Field Engineer. He'll show you how Warner & Swasey Automatics can increase production in your existing floor space, and conserve your manpower.

Warner & Swasey 1 AC Single Spindle Automatic in use at Cloyes Gear Works Inc., Cleveland, Ohio.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Delpark FILTERS PAINT

FROM PAINT SPRAY BOOTH WATER AT

FORD MOTOR COMPANY

DALLAS, TEXAS PLANT

● Keeping paint spray booth water clean has presented many difficult problems. These problems are the result of the over-spray in the wash water system which can not be entirely eliminated by hand skimming. By using proper compounds, flocculation of the over-spray paint particles creates a floating matte on the surface of the water. Through the use of automatic skimming and DELPARK *Industrial Filters* complete and continuous removal of the matte is easily accomplished. Costly hand-skimming is eliminated and tank cleaning requirements reduced to a minimum.

By automatic skimming and filtration, at short intervals or continuously, paint particles are constantly removed and not allowed to settle in the spray booth tank or circulate through the system. Plugged pumps and nozzles and paint sludge deposits in the eliminators are no longer a problem.

DELPARK Engineers are available for consultation with customers on the most satisfactory method of delivering the paint and water to the filter.

Write today for more complete information

Backed by More Than 30 Years in Industrial Filtration

Delpark INDUSTRIAL FILTRATION

PATENTS PENDING

INDUSTRIAL FILTRATION COMPANY
99 Industrial Avenue, Lebanon, Indiana

Gentlemen: Please send more information on Paint Spray Booth Applications of DELPARK *Industrial Filters.*

Name_____ Title_____

Company_____

Address_____

City_____ State_____

SEE THIS TINY HOLE

IN THIS TINY TUBE?

It is plug drawn

By being plug drawn, the tube is endowed with an inside surface of exceptional, mirror like smoothness. Thus the flow it provides is uniform, and uninterrupted, and high efficiency in operation is attained.

THIS DISTINCTIVE TUBE IS CALLED

Capilator*

the capillary tube used for restriction purposes

The accompanying photomicrograph, showing a 200-time magnification of the inside wall of the Capilator, gives you a good idea of the smoothness of this inside surface. The size of the tube shown was .081" O.D. x .031 I.D.

*REG. U. S. PAT. OFF.

When you attend the Inform-A-Show in Los Angeles May 24-27, be sure to visit our Booth 304

It is to your great advantage to learn more about Capilator—indeed an exceptional capillary tube.

WOLVERINE TUBE DIVISION
of CALUMET & HECLA, INC.
Manufacturers of Tubing Exclusively
1439 CENTRAL AVENUE • DETROIT 9, MICHIGAN

ESTABLISHED 1916

Plants in Detroit, Mich. & Decatur, Ala. Sales offices in Principal Cities

Export Department, 13 E. 40th St., New York 16, N. Y.

Other Wolverine Products

CAPILATOR*
—the capillary tube for restriction purposes
COMMERCIAL TUBE
AUTOMOTIVE TUBE
CONDENSER TUBE
COPPER WATER TUBE (K-L-M)
ELECTRIC WELDED STEEL TUBE
FABRICATED TUBULAR PARTS
WOLVERINE TRUFIN*
—the integral finned tube
REFRIGERATION AND AIR CONDITIONING TUBE (Plain or Tin Plated)
S.P.S. PIPE
SPUN-END TUBE†

*Reg. U.S. Pat. Off.
† A Patented Process RE 22465

WOLVERINE
Electric-Welded Steel Tube

Made by tube specialists with a background of over three decades of manufacturing and development of tube exclusively.

This extensive background, working constantly to close tolerances, presents a distinct advantage in manufacturing techniques which redounds to your benefit.

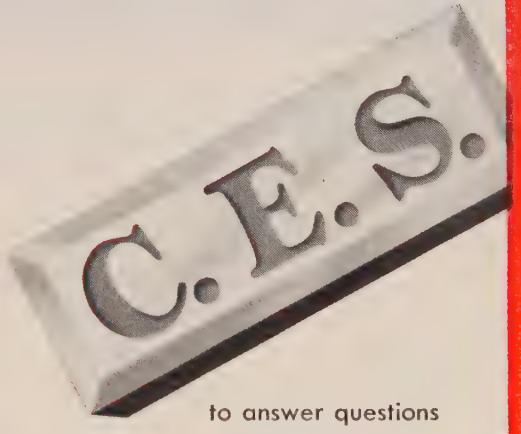
Another Wolverine technique that distinguishes this welded steel tube is the smooth finish on the I.D.

This tube is available to you in these analyses: SAE 1010, SAE 1015, SAE 1020, SAE 1025, SAE 1030, in sizes from ¼" to 3".

WOLVERINE
Customer Engineering Service

We suggest you make use of this valuable service any time you encounter tube problems or whenever you must consider applications that may be unfamiliar to you. Here at your command is a wealth of experience that can prove very helpful to you. It is yours without obligation.

This service encompasses the combined facilities of the following departments: Engineering, Technical Production, Product Development, and Sales—all ready



to answer questions concerning corrosion conditions and the proper choice of alloy, size and temper for such uses as heat transfer, tube fabrication, etc.

ESTABLISHED 1916

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AJAXOMATIC POURING UNIT

In Operation at Montrose Division,

BENDIX AVIATION CORPORATION

Photo shows installation of AJAXOMATIC Combined Holding Furnace and Automatic Pouring Unit in connection with die casting machine. In circle at right is shown a closer view of the spout from which uniform shots of molten aluminum alloy are ejected at exact time intervals.

Now completely automatic die casting of aluminum alloys is possible in smaller quantities than formerly, and at reduced cost. This fact should be of special interest to the manufacturer who has die casting machines in operation and is doing hand ladling. The unit is entirely sealed, the operator feels no heat, accident hazard is eliminated.

This small, compact AJAXOMATIC* unit will increase production of die castings by as much as 25%, because it delivers regular, uniform quantities of metal into the die casting machine with no delay, immediately after dies are closed. The spout itself is heated and the temperature of each metal shot remains constant.

* Patents Pending

For further information send for descriptive folder A-2

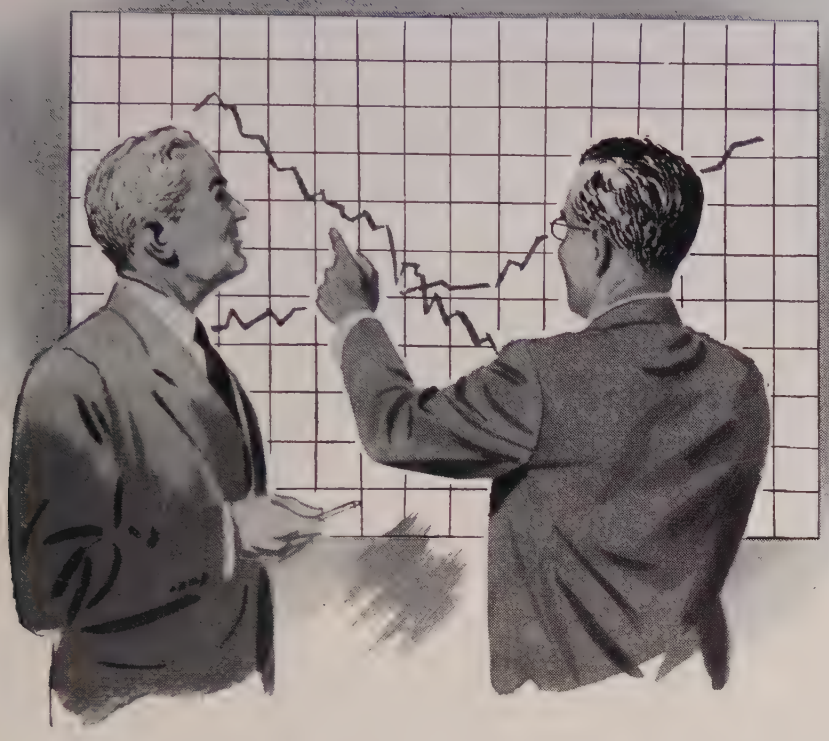
AJAX

TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting



How to start a cost reduction program

1. Authorize a thorough analysis of your product designs.
2. Assign a competent engineer to direct this study.
3. Institute a training program to initiate new design thinking.
4. Provide engineering talent to translate advanced product ideas to practical low-cost production designs.

An Effective System for Cutting Costs. Lincoln Electric has developed a comprehensive training program for designers and production engineers. Known as the Lincoln Weldesign System, the program provides simple methods for improving product strength and appearance while cutting costs as much as 50%.

In-plant Training Program. The simple procedures of the Lincoln Weldesign System for creating efficient, low cost designs can be presented within your own plant to designers and production engineers. Consult your Lincoln Electric representative for details.

For money-backed guarantee on cost reductions through welded steel design write:

James F. Lincoln **PRESIDENT**

THE LINCOLN ELECTRIC COMPANY • 22781 St. Clair Avenue • Cleveland 17, Ohio

THE ACTUAL IS LIMITED: THE POSSIBLE IS IMMENSE

A HE-MAN CRANE FOR A HE-MAN SHOP!

One machine tool primer defines a forge shop as "a place for a real he-man who can stand up and take it."

That overhead electric traveling crane—which must always be ready and able—must also have he-man ruggedness and dependability.

Moving swiftly back and forth—from furnace to forging press—this 25-ton NORTHERN CRANE swings hot billets, too hot and too heavy to handle in any other way.

This is one of the many NORTHERN CRANES installed in the last 54 years to assure the most efficient production from machine tools and other machinery.

USE NORTHERN CRANES

NORTHERN ENGINEERING WORKS

2615 ATWATER STREET, DETROIT 7, MICHIGAN

BUILDERS OF CRANES AND HOISTS EXCLUSIVELY

tool steel is the cornerstone of our business

Just as the cornerstone is of fundamental importance to a building, tool steel is the base of our business. And ever since we were founded — now over 50 years ago — we have been proud of our reputation as the nation's leading producer of tool steels.

We have always given our customers what they needed — quality and service — regardless of their volume of business or the general supply and demand situation. During last year's steel shortage, for instance, all our customers had their share of our production.

You too, can benefit from our long experience in this field through our freely available metallurgical service . . . and from our reliable delivery service through our fully stocked warehouses, conveniently located all over the country.

SEND TODAY for the unique Crucible Tool Steel Selector — a twist of the dial gives the tool steel for your application.

Rex® High Speed Steels
Peerless Hot Work Steels
Halcomb 218
Chro-Mow®
Sanderson Carbon Tool Steels
Ketos®
AirKool Die Steel
Airdi® 150
Nu-Die V Die Casting Steel
CSM 2 Mold Steel
La Belle® Silicon #2
Atha Pneu

SPECIFY YOUR TOOL STEELS BY THESE BRAND NAMES

Crucible Steel Company of America
Dept. S, Chrysler Building, New York 17, N. Y.

Name_____

Company_____ Title_____

Address_____ City_____ State_____

9" diameter, 3-colors

CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

TOOL STEELS

CRUCIBLE STEEL COMPANY OF AMERICA · TOOL STEEL SALES · SYRACUSE, N. Y.

NOW YOU CAN DETERMINE CARBON AND SULFUR CONTENTS IN A SINGLE OPERATION:

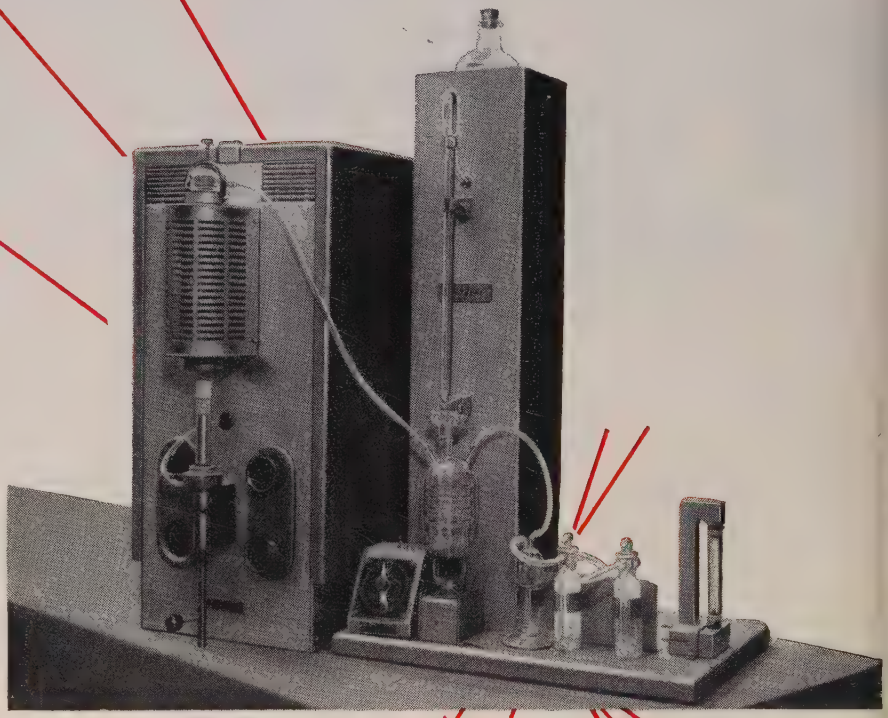
. . running time cut from 35 to 10 minutes

The days of running two separate tests to determine carbon and sulfur contents of iron and steel are over. The Research Laboratories of Lindberg Engineering Company, with the cooperation of A. C. Holler, Twin City Testing & Engineering Laboratory and W. K. Aites of Westinghouse Airbrake Company have developed a new process utilizing a Lindberg high frequency combustion unit to test for *both* carbon and sulfur in a single operation . . and in a total of only 10 minutes!

This represents a time saving of 22 to 25 minutes over conventional methods that require a combined running time of 30 to 35 minutes . . (samples had to be heated in a resistance type furnace for 15 minutes to determine carbon content . . 20 minutes to determine sulfur content).

The Lindberg high frequency combustion unit used in this process is a rough and ready unit, designed and built by the makers of the famous Lindberg heat treating furnaces. It's engineered to heat samples at temperatures up to 3000°F . . substantially higher than previously practical with resistance element furnaces.

If you already have your high frequency equipment, you'll want to adopt this time saving process immediately. If not, check with your nearest Lindberg Laboratory Equipment dealer for details on the Lindberg "HF" unit and this new time saving process.



Here's how the new procedure works:

1. Put 1 gram metallic sample of unknown in ceramic cupelet. 2. Add approximately ¼ gram fine mesh tin to accelerate action . . and cover sample lightly with alundum to prevent splatter and minimize generation of iron oxide. 3. Place cupelet on induction unit pedestal, and raise to position in center of work coil, which surrounds a gas-tight "Vycor" glass tube. 4. Introduce controlled flow of oxygen which purges air from entire system and supports combustion. 5. Turn power from standby to plate position which starts inductive heating . . after 3 minutes, unit automatically switches from plate back to standby position. 6. Products of combusion flow to sulfur titration vessel where all SO_2 is absorbed. 7. Next, remaining products of combustion pass to sulphuric acid tower and magnesium perchlorate bulb for drying . . and then to standard type gravimetric determination bulb containing ascarite.

Now, to make the actual measurements:

1. Flush entire system for 3 minutes . . (then remove gravimetric determination bulb).
2. Titrate to get specific color change to show end point.
3. Read solution level (direct reading) to determine percentage of sulfur in sample.
4. Next, weigh absorption bulb to determine change in weight due to addition of CO_2.

LINDBERG LABORATORY EQUIPMENT DIVISION

Lindberg Engineering Company • 2441 West Hubbard Street • Chicago 12, Illinois

BULLARD

MANUFACTURERS OF MACHINE TOOLS

Sportsman's Paradise — Sun Valley, Idaho

Wide World Photo

The Invisible Background of Industrial Progress

Sun Valley, Idaho, where this awe-inspiring view was taken, offers more than 27 different sports to the thousands of people who visit it each year. Eight mechanically operated chair lifts carry guests to the four surrounding mountains. The highest of these, Baldy Mountain, reaches a total of 3,200 feet above the valley floor. Here a breath-taking panorama of the area unfolds. In some of the mountain areas the chair lifts provide the only means of transporting material, food and supplies as well as the guests to the summit.

Many beauty spots are now being enjoyed more than ever since they have been made accessible by modern transportation facilities.

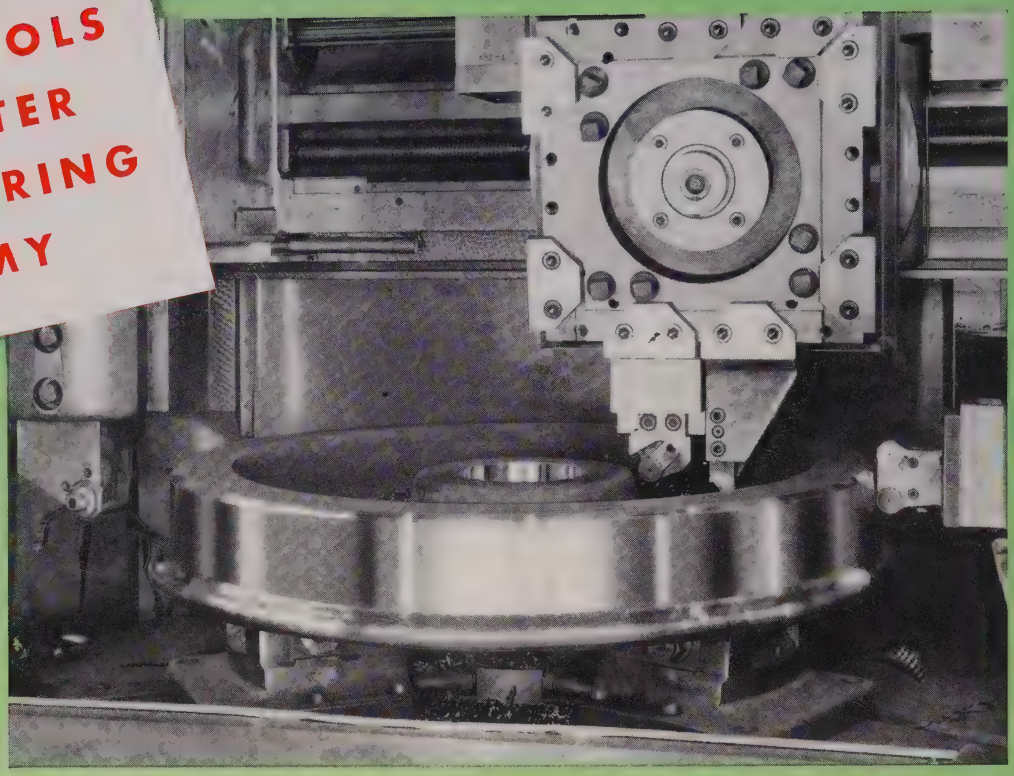
★ As manufacturers of *Modern Machine Tools*, The Bullard Company is proud of its part in the research, engineering and development of accurate, rugged, dependable, versatile, and economically operated machines that have helped build and maintain the American transportation system.

★ *For greater manufacturing economy REFER to next page*

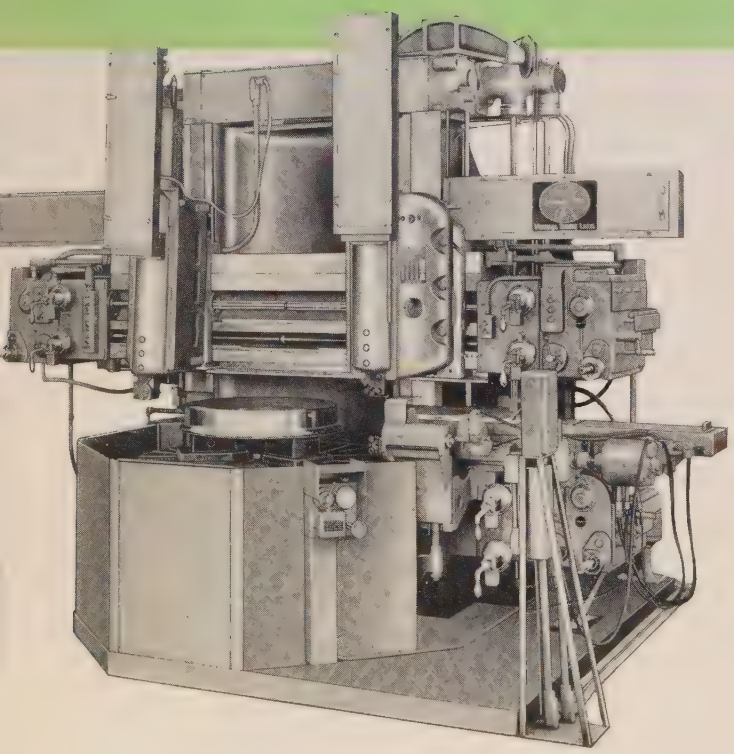
THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

BULLARD MACHINE TOOLS FOR GREATER MANUFACTURING ECONOMY



Bullard Man-Au-Trol Car Wheel Lathe on production of Diesel Locomotive Wheels. One of many now installed for the production of Railroad Locomotive and Car Wheels.



Man-Au-Trol with manual or automatic control has taken the guess work out of the previous manual operations on highly accurate repetitive work.

Automatic change of feeds and speeds at the proper instant, automatic change of direction of feed, automatic precision index of heads for succeeding operations, automatic operation of the heads through their entire cycle of operation, all contribute to the productive efficiency and minimum operator fatigue, at a pace previously unobtainable with single spindle machines of the size and capacity of Man-Au-Trol.

BULLARD

Complete information on request.

THE BULLARD COMPANY BRIDGEPORT 2, CONNECTICUT

Maybe Sandvik can do this Spring Steel trick for you!

Naturally, Sandvik's stock of over 780 spring steel sizes includes many odd ones. The exact size and quality you want may be among them. Why not check with Sandvik?

In fact it makes sense to check with SANDVIK regardless of whether your size requirements are extraordinary or not. If spring steel *performance* is important to you, there's a good chance you'll find a SANDVIK steel that will suit you to a "T."

SANDVIK cold rolled, high carbon strip steel is available:

- **From stock in over 650 cold-rolled, hardened and tempered sizes and over 130 cold-rolled, bright annealed sizes.**
- **Precision rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **In special analyses for specific applications.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**

For further information contact your nearest Sandvik office.

Write for your free copy of this Sandvik Catalog. Describes 785 spring steel sizes.

SANDVIK STEEL, INC.

111 EIGHTH AVE., N. Y. 11, N. Y., WAtkins 9-7180
230 N. Michigan Ave., Chicago 1, Ill. • FRanklin 2-5638
1736 Columbus Rd., Cleveland 13, Ohio • CHerry 1-2303
SANDVIK CANADIAN LTD., P. O. Box 40, Station O, Montreal 9, P. Q.
Sandsteel Spring Division — New York — Industrial Springs
Sandvik Saw & Tool Division — New York — Saws & Tools

Sandvik Quality Steels

SS-91

Europe's largest producer of heavy tools introduces

4 PAGES OF NEW HEAVY DUTY SCHIESS MACHINE TOOLS

and announces the formation of

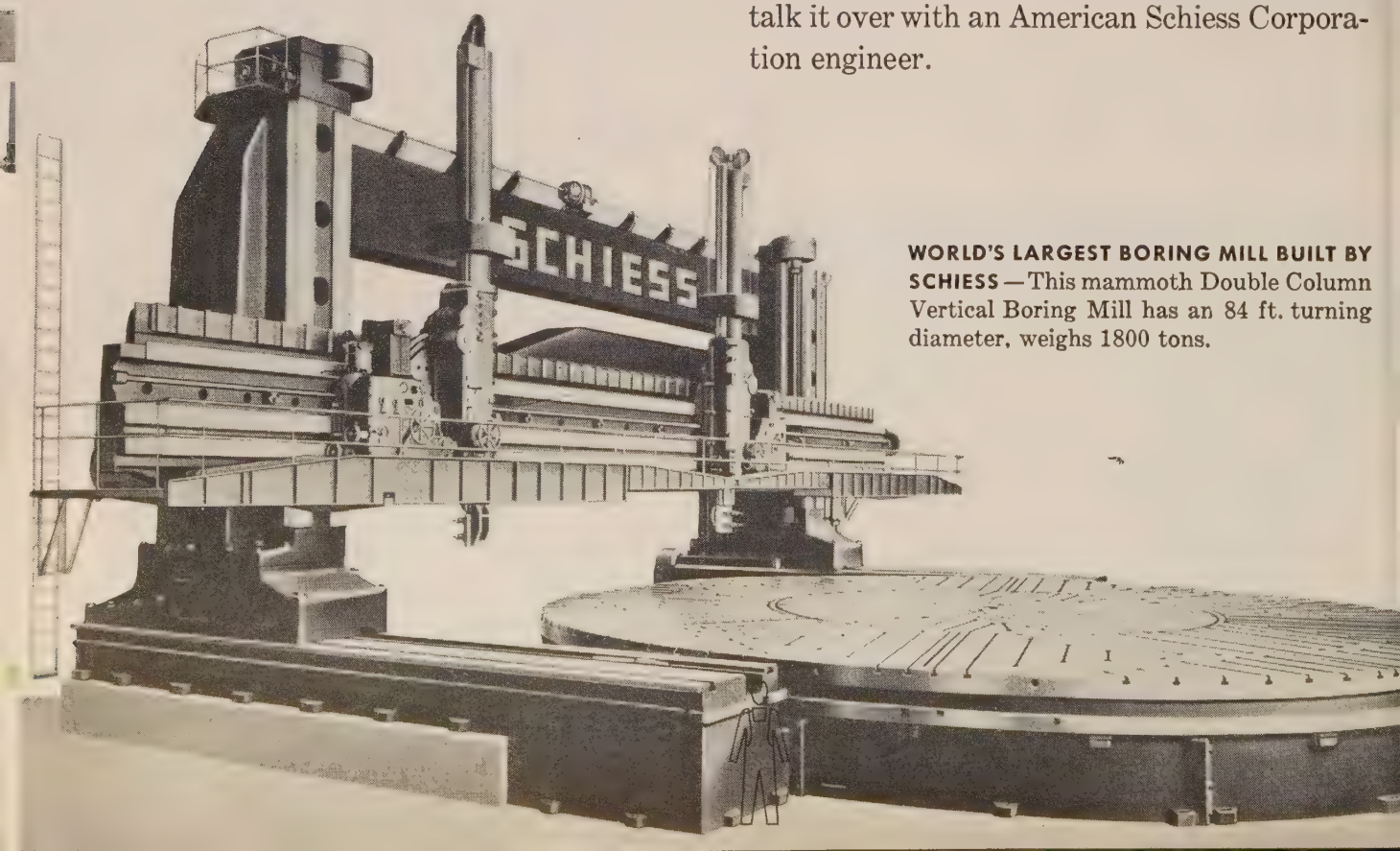
AMERICAN
SCHIESS
CORPORATION

with Schiess factory engineers at the Pittsburgh Service Center to supervise installation and servicing, and for consultation on special requirements.

Machine tools don't come much bigger—or better—than SCHIESS builds them, and has been building them for over 80 years to meet the precision requirements of the world's largest metalworking plants.

Now American Industry can also obtain these world-famous heavy producers with assurance that the same stand-by factory-trained engineering assistance will be permanently available here just as if the Schiess plant was located in the U.S.A. Spare parts will also be stocked here.

The newest Schiess machines—many already in operation in major American plants—are briefly described on these four pages. But you'll want the whole story on the particular equipment that's just right for your job. So talk it over with an American Schiess Corporation engineer.

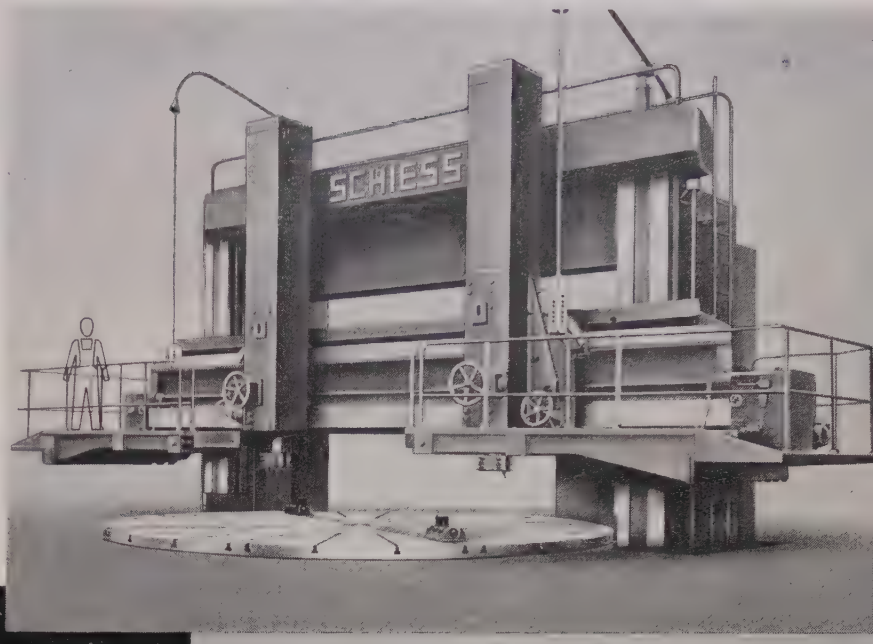


WORLD'S LARGEST BORING MILL BUILT BY SCHIESS—This mammoth Double Column Vertical Boring Mill has an 84 ft. turning diameter, weighs 1800 tons.

See the machines at
Canadian International Trade Fair, Toronto
Booths 4441-4449 and 4542-4550 Bldg. E4
June 1-12

By combining basic Schiess elements, extra heavy machines that would normally be considered special tools, can be built to your work diameter and load requirements.

The equipment shown here is typical of unusually large boring mills of latest Schiess design which, like the smaller models, incorporate new operating features listed below.



Model 3K Vertical Boring Mill
with 15 ft. turning diameter

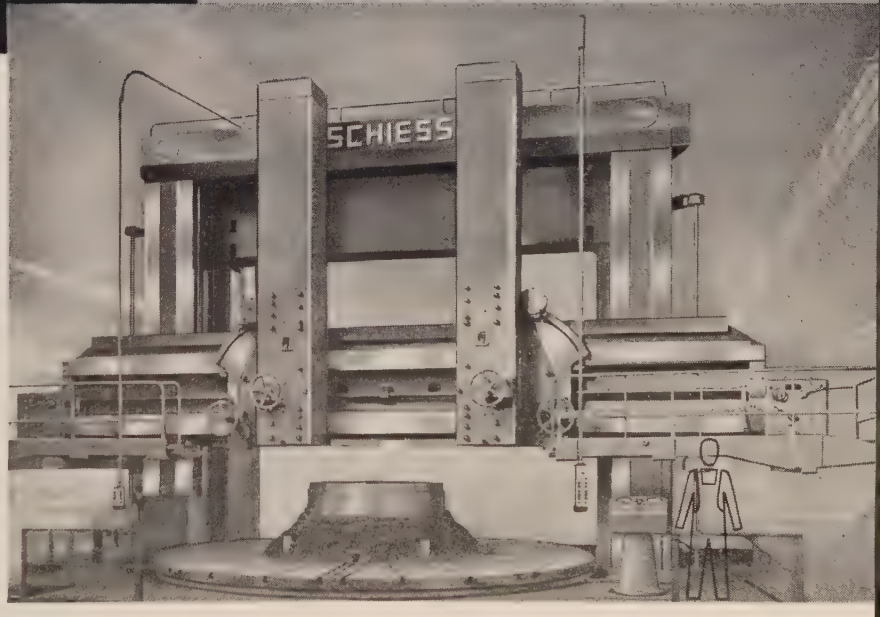
NEWLY DESIGNED

HUGE VERTICAL BORING & TURNING MILLS *like these* -

Built from basic Schiess designs to any diameter from 10 ft. to 84 ft.

MORE SCHIESS TOOLS

Model 5K Vertical Boring Mill
with 22 ft. turning diameter



- **Fingertip Speed Control**
- **Counterbalanced cross rail and side head**
- **Octagon rams which can be swiveled, completely enclosed**
- **Pendant Control**
- **Automatic Lubrication**

Vertical Boring Mills of this type can be equipped with inner and outer tables—and with 1 or 2 operator control panels.

Engineering Division

AMERICAN SCHIESS CORPORATION

38th Street and AVRR, Pittsburgh, Pennsylvania

Sole Distributor

KURT ORBAN COMPANY, INC.

205 East 42nd St., New York 17 • 4220 Prospect Ave., Cleveland 3
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Hydraulic pre-selection of speeds set by handwheel and read on illuminated dial. 16 spindle speeds—ratio 1:50—up to 310 rpm for carbide machining on Model KE 100. Table runs on tapered roller bearings.

Fingertip control for direction of feed and rapid traverse with spring-loaded mono-levers for normal direction plus angular compound feeds. Mono-levers move in same direction as desired feed or traverse movement, simplify correct setting by operator. Specially designed electro-magnetic disc clutches disengage feed instantly with no over-riding or coasting.

Counterbalanced cross rail and side head. Single lever unlocks, raises or lowers, and locks cross rail simultaneously by electro-mechanical controls. *No bolts or nuts to loosen or tighten by hand.*

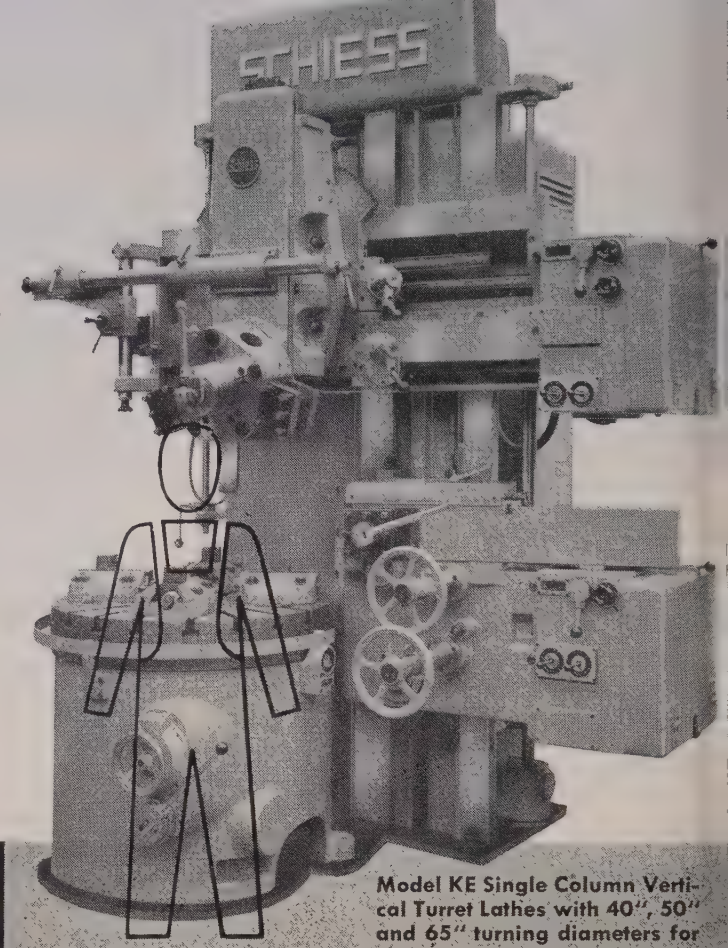
All-vertical gear drive with main motor mounted on back of machine, directly connected to gear box. Changes in direction of drive transmitted to table without bevel gears, eliminating vibration and backlash.

Copying attachment with electric tracer for use either on cross rail or side head.

NEWLY DESIGNED

VERTICAL TURRET LATHES AND BORING MILLS

like these -



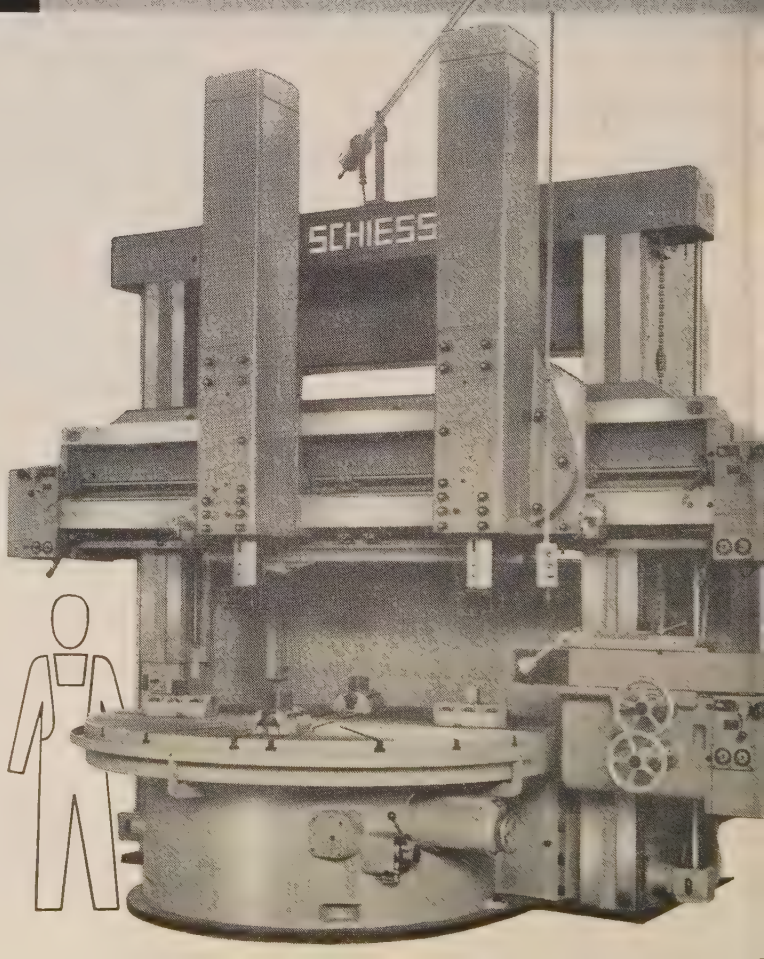
Model KE Single Column Vertical Turret Lathes with 40", 50" and 65" turning diameters for high-speed carbide machining.

Model KZ Double Column Vertical Boring Mills with 65", 80", 98" and 118" turning diameters.

All operating features of KE Series Vertical Turret Lathes are combined in the

SCHIESS KZ DOUBLE COLUMN VERTICAL BORING MILLS, PLUS—

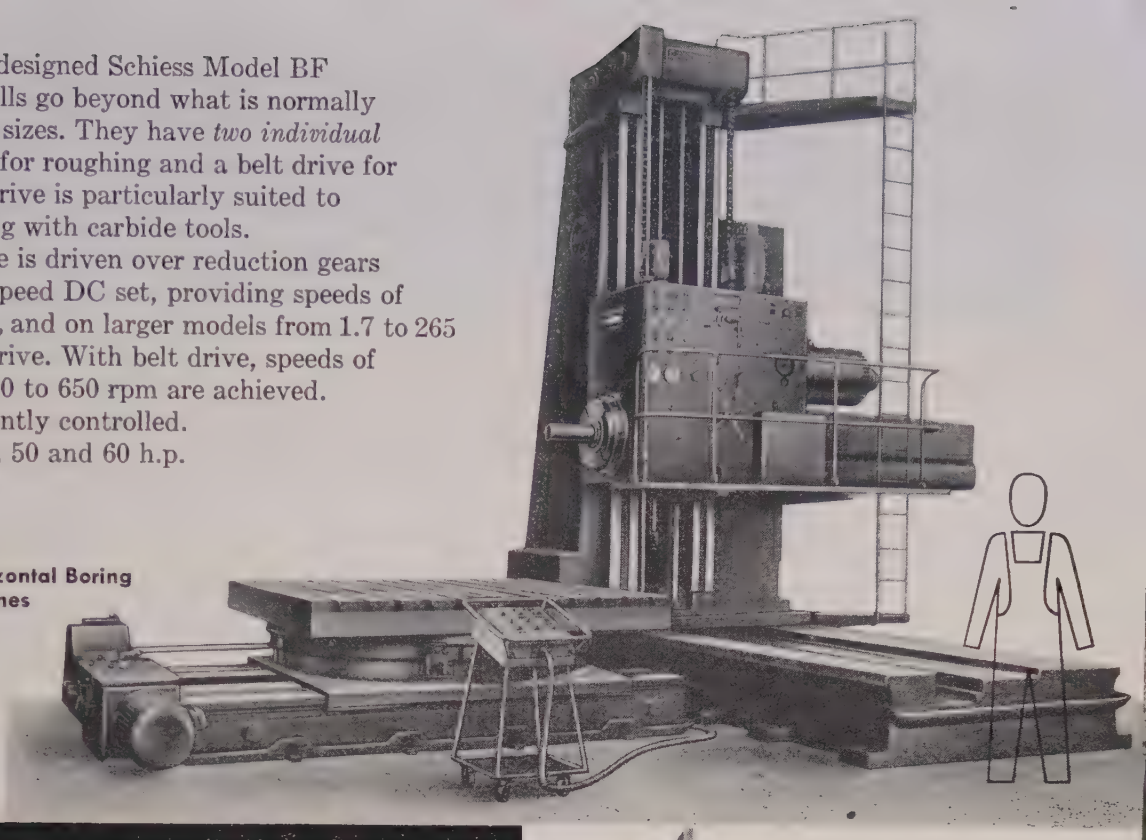
Heads equipped with steel octagon rams can be swiveled—have automatic feed in vertical, horizontal and angular direction and are independent of one another as to amounts and direction of feed. Table operated by three-button pendant control.



Schiess factory engineers are now permanently located at American Schiess Corporation's Pittsburgh Service Center to install and service Schiess equipment, train operators and consult with your engineers on special-purpose equipment.

These completely redesigned Schiess Model BF horizontal boring mills go beyond what is normally considered standard sizes. They have *two individual drives*—a gear drive for roughing and a belt drive for finishing. The belt drive is particularly suited to high-speed machining with carbide tools.

The boring spindle is driven over reduction gears through a variable speed DC set, providing speeds of from 2.7 to 325 rpm, and on larger models from 1.7 to 265 rpm with the gear drive. With belt drive, speeds of 30 to 750 rpm and 60 to 650 rpm are achieved. Rams are independently controlled. Main motors are 40, 50 and 60 h.p.



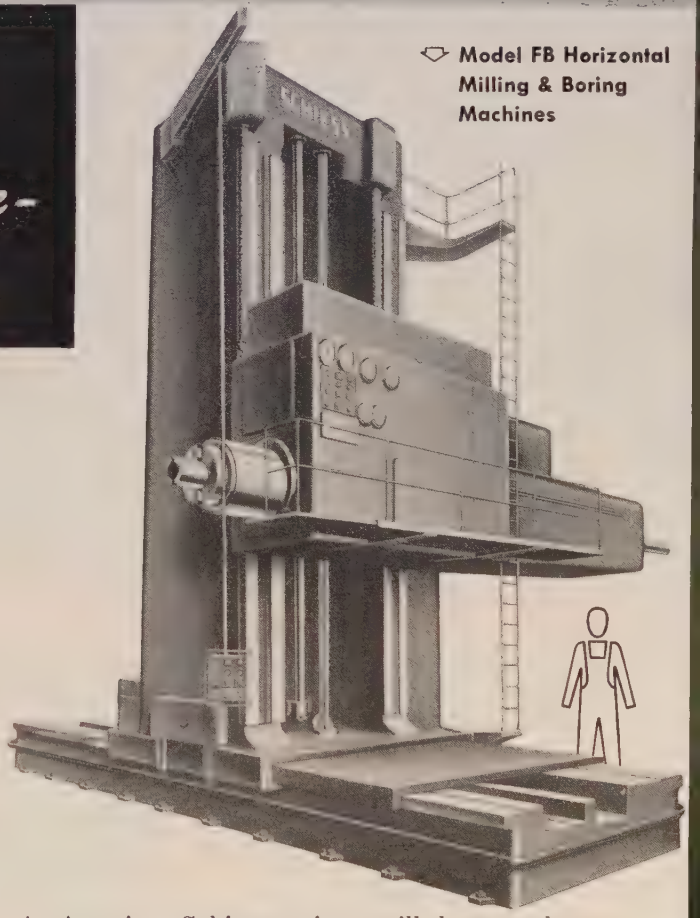
Model BF—Horizontal Boring & Milling Machines

NEWLY DESIGNED

HORIZONTAL BORING & MILLING MACHINES *like these*–

Standard sizes begin where other builders end

Spindle Diameters 6¼", 7½", 8⅞", 10⅜", 12⅜"



Model FB Horizontal Milling & Boring Machines

An entirely new development...

SCHIESS HORIZONTAL MILLING & BORING MACHINE

Here is a radically new departure in machine tools—the Schiess Model FB horizontal *milling* and *boring* machine. Rugged and precise, the Model FB is primarily designed for heavy milling cuts and for certain types of facing work. These limited specifications tell only part of the story of this unique machine:

Specifications	FB 28/16	FB 32/19	FB 36/22.5
Diameter of Milling Spindle.....	11"	12⅜"	14¼"
Diameter of Boring Spindle.....	6⅝"	7½"	8⅞"
Diameter of Milling Spindle Sleeve	18⅞"	21¼"	24"
Maximum diameter bored.....	35½"	55"	86½"
Maximum diameter faced.....	55"	86½"	102"
Main Motor.....	60 h.p.	60 h.p.	85 h.p.

Gear Drive for roughing, Belt Drive for finishing

An American Schiess engineer will show you how you can adapt this new type heavy producer to your special needs

Engineering Division

AMERICAN SCHIESS CORPORATION

38th Street and AVRR, Pittsburgh, Pennsylvania

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KO CO., INC. INDUSTRIAL IMPORTERS

KURT ORBAN COMPANY, INC

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There's a *simple* way to solve what appears to be a complex speed reduction problem

Get the proper drive combination that best meets your requirements from the broad LINK-BELT line

YOU'LL find your power transmission costs are lowered several ways when you use Link-Belt enclosed gear drives. First, Link-Belt offers a broad range of types and sizes in helical, herringbone and worm gear designs. You get the *one* reducer best suited to your needs.

In addition, Link-Belt builds a complete line of power transmission machinery. Installation and alignment are simplified because dimensions of Link-Belt chains and sprockets, bearings and couplings are all coordinated. And there's no need to call in another firm for any information or assistance.

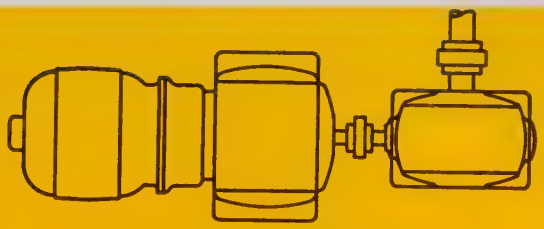
This overall integration—plus the long life built into every piece of Link-Belt equipment—guarantees optimum efficiency. Result: lower power consumption and maintenance costs.

Make the nearby Link-Belt sales office or distributor your power transmission headquarters. Nowhere else can you get the great selectivity that assures you of the best in enclosed gear drive applications.

LINK-BELT

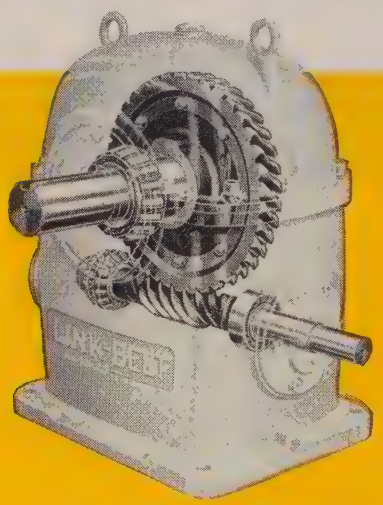
ENCLOSED GEAR DRIVES 13,127

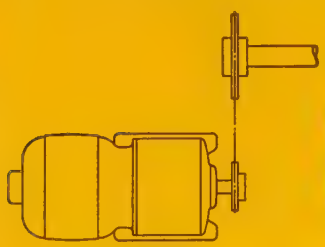
LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

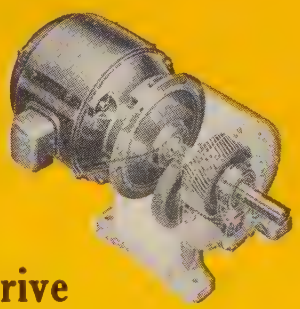


Worm Gear Drive

WORM GEAR and P.I.V. variable speed drives are shown direct-coupled. Link-Belt worm gear drives are available in 3.1:1 to 8000:1 reduction ratios—1400 to 123,000 in. lbs. torque—0.22 to 564 output shaft rpm. Ask for Book 2324A.

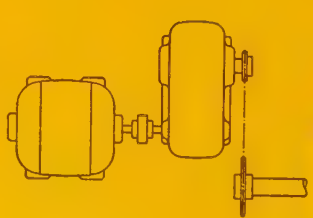


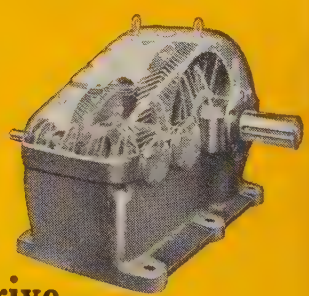




Gearmotor & Helical Gear Drive

GEARMOTOR is shown with roller chain drive. Link-Belt Helical Gear Drives, Gearmotors and Motogears are available in 6.2:1 to 292:1 reduction ratios—1 to 30 hp—6 to 280 output shaft rpm. Ask for Books 2247 and 2451.





Herringbone Gear Drive

HERRINGBONE GEAR DRIVE is shown connected by flexible coupling to motor and with roller chain takeoff. Link-Belt Herringbone Gear Drives are available in 2.84:1 to 326:1 ratios—0.4 to 2480 hp—2.2 to 623 output shaft rpm. Ask for Book 2519.

IBLE
ROP
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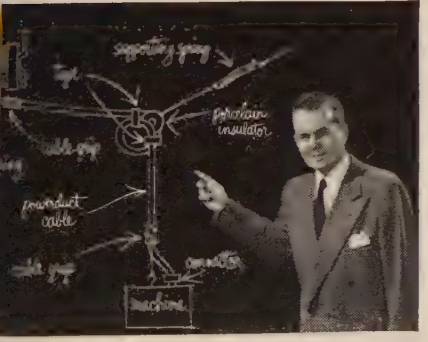
ERDUCT eliminates
insive rewiring
equipment must
oved.

This cable makes machinery mobile



LUG IN POWERDUCT at busduct and machine. See how spring keeps cable taut. There is no costly rigid conduit to rip out.

You may not be utilizing the full flexibility of your busduct system . . . if you aren't matching it with equally flexible, UL-approved ANACONDA Powerduct Cable.

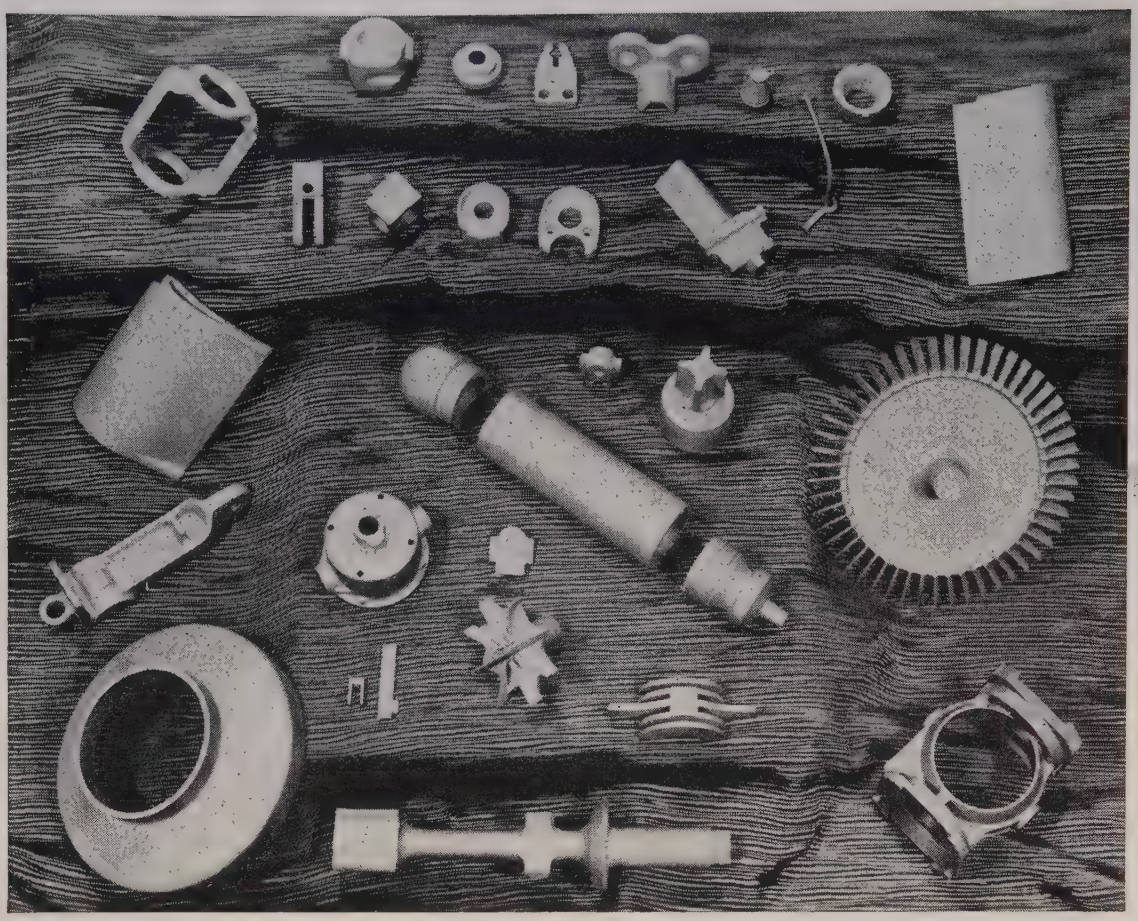
This busdrop cable permits you to quickly relocate machinery. There is none of the expense and bother of ripping out permanent or semi-permanent wiring.

Powerduct is the only nonmetallic-armored busdrop cable approved by Underwriters' Laboratories, Inc. for busway branches under section 3646, 1951 National Electric Code. Always ask for it at your regular supplier. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.* 53319

ANACONDA®

TODAY'S HEADQUARTERS FOR INDUSTRIAL WIRING

Building wire and cable • power and busdrop cables • control and communication wire and cable • distribution cables • magnet wire • wire and cable accessories



Inco-Cast precision investment castings offer a practical way to make a wide variety of difficult-to-machine shapes including: thin vanes, wing sections, non-critical gear teeth, slots and threads.

How you can save up to 50%... on small parts

With Inco-Cast precision investment castings, others are saving as much as 50 percent of the production cost on small parts.

Perhaps you can, too. If you need small parts with complex internal sections, shallow blind holes, unmachinable cavities or other shapes that are costly to make, it may pay you to investigate precision casting. For precision casting lends itself to economical production of intricate shapes where tolerances as close as plus or minus .005" per linear inch are needed.

Inco-Cast precision castings not only save you money—they make it possible for you to use extra strong and harder alloys for longer service life...

- You can reduce your machine shop bottleneck because they require little or no machining.
- They make possible the use of hard-to-machine metals.
- In many applications you can get parts made by precision casting that would be impossible to make by other methods.
- Frequently it's even possible to simplify your designs when you use precision castings.

If you have a problem with a part whose cost of production seems out of line — if it's a shape where a single casting might eliminate many machining operations — if you have a design that cannot be worked out economically — just send a blueprint or actual sample with an estimate of the quantity needed.

Inco casting specialists will analyze your problem and, if precision casting is a practical solution, they will give you an estimate of costs and their suggestion on the best alloy to use.

In the meantime, for more detailed information about this money-saving process, write for your free copy of "Investment Casting—Its Advantages and Practical Applications."

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

SOME ALLOYS PRECISION CAST BY INCO

Nickel-Base Alloys
Ferrous Alloys
Austenitic Stainless Steels
Martensitic Stainless Steels
Ferritic Stainless Steels
Carbon Steels
Alloy Steels
Tool Steels
Cobalt-Base Alloys

Inco Castings PRECISION, SAND, CENTRIFUGAL

INCO TRADE MARK

The Metalworking Outlook

May 4, 1953

Business Sprints Ahead

If the current economic pace continues, American business will post an alltime record performance for 1953. Currently, gross national product is at a peak annual clip of $363 billion. Estimated investment in non-farm producers' durable equipment rose to a record $23.3 billion in the first quarter as nonresidential construction moved up to $12.5 billion. Inventory accumulation is moderating from fourth quarter, 1952, highs when total stocks hit an $8.1 billion annual rate. The FRB industrial production index is now at about 242 per cent of the 1935-1939 average, 20 per cent above mid-1950.

More Capital Outlays for Modernization

Surprisingly high capital expenditures account for much of the zip in today's economy. A record $27 billion will probably be spent on new plant and equipment in 1953, despite the fact that the peak in defense expansion is passed. More money now than at any time since the Korean war started is going into modernization, rather than increased facilities. Machinery & Allied Products Institute points out that this trend will be further implemented if proposed reform in the Bureau of Internal Revenue's depreciation rules comes through. As it looks now, such change will occur eventually because the Eisenhower administration favors it.

Can the Auto Boom Last?

Auto production is another factor accelerating today's boom. Factory sales of new motor vehicles climbed to 700,685 units in March, boosting the first quarter total of 1,848,858 more than 43 per cent above the comparable 1952 figure. Even so, first quarter totals are still slightly under the 1,980,000 sold in the first quarter of 1951. Doubts are accumulating that such a pace can be continued, but it didn't slacken in April.

None Too Soon

Despite the optimism, Association of Consulting Management Engineers says it's none too soon to put your business house in order so you can be prepared for anything. It advises: Work out an executive development program to fit your needs; take another look at your cost reduction plans; reappraise your markets; invest more in research; work out your break-even point for various volumes of production below the level at which you are currently producing; save your cash in every way you can.

Small Business and Defense

Watch for legislation that will seek to give more defense work to small business. A special report by the Senate Small Business Committee says that after the defense contracting dollar has been fully spread around to manufacturers only about 14 per cent of it goes to small firms. The committee says that 29 of the country's biggest prime

duction-Engineering News—p. 97 The Market Outlook—p. 157

contractors got 41.2 per cent, or about $12 billion worth, of the dollars awarded in primes by the Defense Department in the two years after Korea.

High War Spending

President Eisenhower's proposed $8.5 billion cut in appropriations for the next fiscal year won't mean a decline in defense expenditures for another year. That's because of the huge carryover of defense funds previously appropriated and largely obligated. Actual defense spending will increase over the next few months because of a contemplated speed-up of goods already on order, notably new weapons.

Discriminating Budget Cuts

The House is doing a lot of budget-slashing, but not indiscriminately. For example, it restored a $1.2 million cut for the Bureau of Mines. That will permit the bureau to continue operating the oil-from-shale plant at Rifle, Colo., a facility which some day could provide the technical basis for a whole new private industry.

Labor: More State Control

The trend in Congress is to enact legislation that will return to the states some of the present federal control over labor-management disputes. S. 1785 introduced by Sen. H. Alexander Smith (Rep., N. J.) is a move in that direction. The trend has the support of representatives, too.

Straws in the Wind

Carboloy Department, Detroit, of General Electric Co. is reducing prices by at least 10 per cent on most sizes of its standard die line . . . Watch for Congress to extend export licensing and control for three years, instead of five requested by the White House . . . General Motors Corp.'s Chevrolet Division will start work this summer on a 750,000-square-foot spring and bumper plant near Detroit; it's scheduled to be in production by June, 1954 . . . Now it's official: Kaiser-Frazer Corp. has signed the papers to acquire Willys-Overland Motors Inc.

What Industry Is Doing

A supply-demand balance—already here for copper—may occur for aluminum in July, for steel in November (p. 55) . . . Consumption of zinc is soaring this year, but price fluctuations hurt business (p. 57) . . . Sales of house trailers in 1952 rose 29 per cent to $319.9 million and may continue upward this year (p. 58) . . . Research finds new uses for oil, grease and dust seals (p. 59) . . . Steel company sales are on the way to attaining a new record, but net profits still aren't satisfactory (p. 60) . . . Gearmakers are turning more to package gearing units, such as speed reducers, to round out production (p. 60) . . . Civilian orders are pouring into the tool and die industry (p. 61) . . . Carborundum Corp., Niagara Falls, N. Y., instructs sales trainees through intensive dry-run practice (p. 66).

When you need stainless steels quickly from warehouse stocks, you'll find it pays to call one of the seventy-six Distributors of Armco Stainless Steels listed on this page.

It's a good idea to keep in close touch with the Distributor nearest you. He may be able to solve some of your steel problems sooner than you think.

Besides offering stainless steels, the Armco Distributor can also supply you with "how-to-do-it" fabricating manuals.

CALIFORNIA
Ducommun Metal & Supply Co., Los Angeles
Electric Steel Foundry Co., Los Angeles
Electric Steel Foundry Co., San Francisco

COLORADO
C. A. Crosta, Inc., Denver
Metal Goods Corp., Denver

CONNECTICUT
The American Steel & Alloys Corp., Hartford
Herrick Company, Hartford

FLORIDA
Horne-Wilson, Inc., Jacksonville
Horne-Wilson, Inc., Miami
Horne-Wilson, Inc., Orlando
Horne-Wilson, Inc., Tampa

GEORGIA
Horne-Wilson, Inc., Atlanta
J. M. Tull Metal & Supply Co., Atlanta

ILLINOIS
Central Steel & Wire Co., Chicago
Chicago Steel Service Co., Chicago

INDIANA
W. J. Holliday & Co., Hammond
Tanner & Company, Indianapolis
W. J. Holliday & Co., Indianapolis

KENTUCKY
Conner Mfg. Co., Louisville

LOUISIANA
Metal Goods Corporation, New Orleans
The Orleans Steel Products Co., Inc., New Orleans

MAINE
Herrick Company, Auburn
Brown-Wales Company, Lewiston

MARYLAND
Seaboard Steel & Iron Corp., Baltimore

MASSACHUSETTS
Brown-Wales Company, Cambridge
Industrial Steels, Inc., Cambridge
Congdon & Carpenter Co., Fall River
Herrick Company, South Boston
Warren F. Hoye, Inc., Springfield

MICHIGAN
Central Steel & Wire Co., Detroit
Semmler Wholesale Supply Co., Detroit
The Behler-Young Co., Grand Rapids
Semmler Wholesale Supply Co., Saginaw

MISSOURI
Richards & Conover Hardware Co., Kansas City
Metal Goods Corp., North Kansas City
Metal Goods Corporation, St. Louis
E. E. Souther Iron Co., St. Louis

NEBRASKA
Gate City Steel Works, Inc., Omaha

NEW JERSEY
Edgcomb Steel Corp., Hillside
Peter A. Frasse & Co., Inc., Lyndhurst
Mapes & Sprowl Steel Co., Union

NEW YORK
Brace-Mueller-Huntley, Inc., Buffalo
Peter A. Frasse & Co., Inc., Buffalo
Brace-Mueller-Huntley, Inc., Rochester
Follansbee Metal Warehouses, Rochester
Brace-Mueller-Huntley, Inc., Syracuse
Peter A. Frasse & Co., Inc., Syracuse
Peter A. Frasse & Co., Inc., N.Y.C.

NORTH CAROLINA
Edgcomb Steel Company, Charlotte
Horne-Wilson, Inc., Charlotte

OHIO
Central Steel & Wire Co., Cincinnati
Cleveland Tool & Supply Co., Cleveland
Inland Steel Products Co., Inc., Cleveland
Osco Steel Company, Cleveland
Vorys Brothers, Inc., Columbus
C. F. Throm & Sons, Toledo

OKLAHOMA
Metal Goods Corporation, Tulsa

OREGON
Electric Steel Foundry Co., Portland

PENNSYLVANIA
Edgcomb Steel Company, Philadelphia
Peter A. Frasse & Co., Inc., Philadelphia
Follansbee Metal Warehouses, Pittsburgh
York Corrugating Company, York

RHODE ISLAND
Congdon & Carpenter Co., Providence

TENNESSEE
C. M. McClung & Co., Bristol
C. M. McClung & Co., Knoxville
Pidgeon-Thomas Iron Co., Memphis

TEXAS
Metal Goods Corporation, Dallas
Maxwell Steel Company, Fort Worth
Metal Goods Corporation, Houston

VERMONT
Herrick Company, Burlington

WASHINGTON
Electric Steel Foundry Co., Seattle

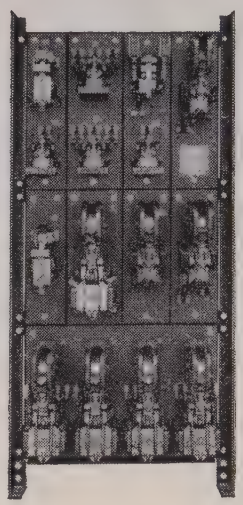
WISCONSIN
Central Steel & Wire Co., Milwaukee

DISTRICT OF COLUMBIA
York Corrugating Co., Washington

DOMINION OF CANADA
Firth-Brown Steels, Ltd., Montreal, Quebec
Firth-Brown Steels, Ltd., Toronto, Ontario
Esco, Ltd., Vancouver, B.C.

Armco Steel Corporation
3363 CURTIS STREET, MIDDLETOWN, OHIO
EXPORT: THE ARMCO INTERNATIONAL CORPORATION

This EC&M Braking Panel replaces all mechanical braking devices in southern fertilizer plant and operates satisfactorily in severe acid atmosphere.



Change-Over to Dynamic Braking Control by EC&M Results in Smoother, Safer Operation of Bucket Cranes

Dynamic Braking Bridge-Stop Control provides an all-electric braking system in which the **driving** motor also acts as the **braking** motor. Operator applies normal stopping by means of a 2-position foot switch which gives two points of dynamic braking depending upon the speed of the crane and the accuracy of stopping desired. Should power fail, dynamic braking is automatically applied to bring the crane to rest quickly, regardless of the position of the master switch.

SOMETHING had to be done! One of the cranes in this plant had partially jumped the runway when power failed at instant of plugging. Ordinary braking methods failed. Magnetically-released, mechanically-set brake wore down rapidly under hard service. Motor burnouts, shaft and gear failures spelled costly delays. Repairs were a nightmare.

So, a change-over was made to all-electric braking. This eliminated costly production delays. Maintenance became merely a routine inspection of motors and controllers. Operation became 100% satisfactory. And the operators warmed up to the smoother stopping.

Dynamic Braking Bridge-Stop Control offers advantages for your cranes. May we send you Bulletin 921-6.0?

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET ★ CLEVELAND 4, OHIO

Spade Work Not Glamorous

Because last Thursday was the 100th day of President Eisenhower's administration many commentators felt called upon to compare accomplishments during this period with those of the first 100 days of Franklin D. Roosevelt's rule. The contrast is striking. New Dealers launched nearly a dozen new federal agencies in their first 100 days. President Eisenhower's party has little of such spectacular action to its credit in its initial 100 days.

The reason is simple. New Dealers were expanding the federal government to take over welfare activities which previously had been administered by state, local or private organizations. Success in this field led to attempts to spread the jurisdiction of the federal government into almost every phase of a citizen's life. After 20 years, this resulted in a supergovernment in Washington which has far outgrown the ability of Congress to control it.

Consequently, one of the clearest mandates given to the Eisenhower administration last November was to trim the federal government to controllable size. That is why Eisenhower's associates are not engaged in dreaming up agencies comparable to AAA, NRA, WPA, etc. Instead, they are working to get the government out of activities which can be carried on more efficiently or more appropriately by state, local or private operation.

Major objectives in this "trimming-to-size" operation are reversing the tide of inflation, reducing the national debt, easing the burden of taxation and gradually restoring the purchasing power of the dollar.

Many of the steps required for the successful attainment of these objectives are unpopular. Abandoning government departments or services never can be as pleasing and spectacular as creating new ones. For this reason much of the spade work of the Eisenhower administration during its first 100 days has not been glamorous

However, its effectiveness will become apparent soon. Already there are signs that inflation has been curbed. Before long we will have reports that the dollar buys more goods. If we can gradually lift the value of the dollar from 52 cents, to 55, to 60 and on up to parity, nobody will care whether Ike's first 100 days were glamorous or otherwise.

E. L. Shaner

EDITOR-IN-CHIEF

BALANCES APPROACHING: Metalworking companies can look forward to an easing in their supply problems. Copper supply already is in balance with demand and, in fact, a buyer's market is driving prices downward. Aluminum will come into balance in midsummer. Steel products will continue tight until autumn.

Steel's quarterly survey of inventories of metals in consumers' plants and of deliveries on

the three major metals (p. 55) indicates this time table. Surprising is the fact that steel inventories are slightly lower than they were three months ago. This results primarily from the big push in automobile and appliance production which has caused suppliers for those industries to dig into stocks during the three months just ended. Average deliveries on steel products are improved. The continued high consumption of steel amazes many students of the markets, including producers, who earlier had expected a balance to be achieved by early summer.

Aluminum inventories are substantially improved. More primary output is coming into the market and is being added to inventory by consumers who see little likelihood of a downward price movement and who suspect some upward adjustments may be coming.

* * *

SELLING THE AUTOMAKERS: Just because you consider your company small, don't hesitate to tackle the big automakers for business (p. 69).

The industrial giants like General Motors, Ford and Chrysler in reality comprise a lot of small companies operating as individual units but guided by a single nervous system. Centralized purchasing departments appear complex and impenetrable but it doesn't take too long to find one's way around and remember that each plant does some buying on its own, too.

So, if you're not doing business with the $10 billion automotive industry, find out what is needed, whether you can make it and you may have found a way to fill some gaps in your production capacity.

* * *

NEW ERA IN STEEL: Attend any gathering of steel plant operating men and you probably will hear the remark expressed several times that sooner or later the electric furnace will supersede the open hearth in making steel.

In the past few years, electrics have grown spectacularly in size from small jobs for making specialties to giants in the 100-ton class for making carbon steels. In several instances, steel plants have switched over completely from open-hearth to electric steel.

Contributing to the rapid advance in electric steel, is induction stirring (p. 104), developed in Sweden and in use in Timken's Canton plant. It cuts down melt time, eases slagging off and makes steel of greater uniformity.

Developments like this will make the electric furnace increasingly acceptable in making steel on a large-tonnage basis.

* * *

"NO FIGURE IN MIND": The annual wage drive now getting underway by the United Steelworkers of America-CIO appears to have less power behind it than earlier postwar campaigns. President McDonald says the union has "no figure in mind at all."

In most prior years, union leaders demanded higher wages to compensate for increased living costs. Lately the cost of living has been level or tending downward. During the Truman-Roosevelt regimes, the union leaned heavily on White House support for their demands. That support now is lacking.

Steel company earnings in 1952 and in the first quarter of 1953 were modest, destroying an oft-used argument on ability to pay. In fact, steel producers are finding it necessary to adjust prices upward, mostly through revision in extras.

The outlook for any substantial wage gains by the union is dim. The outlook for labor peace is good.

* * *

PRICE PROBLEM: Major problem confronting zinc producers — and consumers — is wide and frequent price fluctuations. Prices on this commodity (p. 57) changed 21 times in 42 weeks since last June.

Many domestic producers are operating their mines only because they lose less by operating them than they would by closing the mines down. Consumers, while welcoming price declines, also find much in favor of price stability. Too often, wide price fluctuations place the consumer in a noncompetitive position.

One proposed remedy for the problem is the Simpson bill which would tax imports whenever the price in the United States falls below 15.5 cents a pound. Custom smelters who obtain concentrates abroad contend the proposed "cure is worse than the disease."

Notwithstanding its price problems, the industry will sell more zinc to metalworking companies this year than ever before.

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Western Office: Chicago, Ill. • Northern Office: Cleveland, O.

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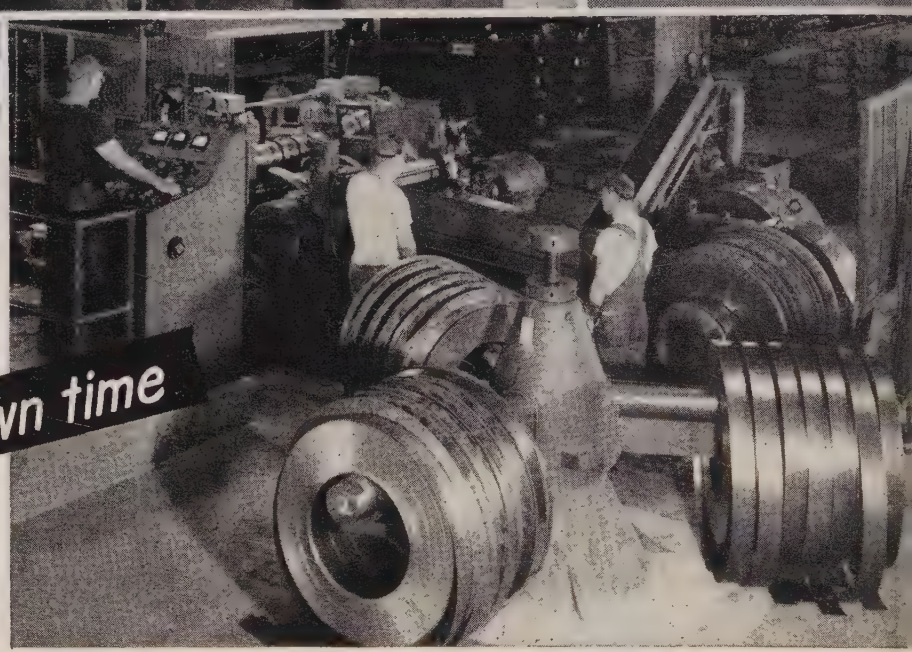

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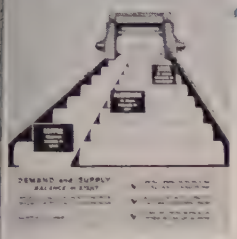
STEEL QUARTERLY SURVEY

Average Inventories	Last Quarter	Current Quarter
STEEL	42 days	40 days
ALUMINUM	39 days	46 days
COPPER	42 days	40 days



In Sight: Supply-Demand Balance for Metals

THE BALANCE between supply and demand for copper products is already here; it will arrive in midsummer for aluminum; and expect it this fall for steel.

Those are conclusions that can be drawn from STEEL's quarterly survey on the supply-demand picture for the three major metals. The general outline of that picture was forecast three months ago by the last survey (Feb. 9, p. 59), but the details are showing up now, a few surprises are also appearing.

Steel — The biggest surprise comes in the decline in the number of days of average steel inventory. As indicated above, the drop from three months ago to now is slight. Yet it's puzzling because of high steel production and faster deliveries. The best average deliveries three months ago were in 20 days. They're about 18 days now.

The factor probably accounting for the inventory drop is the terrific demand for the metal by automotive suppliers who figure prominently in the survey and who had to dig a little into stocks to meet Detroit requirements.

Copper — Stocks of the red metal are down because many users are waiting for the market to clear up pricewise and also because the high prices now are inexorably headed downward.

But copper deliveries are lengthening according to the survey—from an average 11 days three months ago to 13 now. That's because buyers are no longer under allocation control, and thus orders for nonessential goods are swelling basic producers' order books slightly. Mills, too, are slowed in production by the market's uncertainty.

Aluminum — Inventories of the light metal are up substantially because more primary output is coming into the market, some of which is going in to inventories. Users are anxious to stock up because there's little chance of a downward price move and there's a possibility of scattered upward adjustments.

Yet aluminum deliveries are lengthening according to the survey from 13 days on the average three months ago to 19 days now. That's because of the stockbuilding which is keeping demand high for aluminum producers who consequently can't give faster shipments to all customers.

What They Want — But the general situation is good. The majority of all respondents to the questionnaires say their ideal inventory position is the 30-60 day category. A glance at the survey results on p.56 reveals that for most of the 19 products more companies have stocks in that "ideal" group than in any other classification.

Product imbalances persist, especially in steel. Giving the most trouble are hot-rolled sheets and strip, light plates, structural shapes and hot-rolled carbon bars over 1 inch. The situation in sheets and strip is worse than it was three months ago, respondents report. In the other tight products, conditions are still unsatisfactory but better than last quarter. In aluminum, sheets, extruded shapes and tubing are giving the most trouble.

More Cautious—Some 83 per cent of the respondents say they are now watching their inventory levels carefully, substantially more than so reported last quarter. Use of irregular supply sources continues to wane and currently only 12 per cent of the respondents use conversion, exchange or foreign suppliers. Some 17 per cent reported they used irregular sources last quarter.

Some 63 per cent of the respondents expect general material inventories to be larger in three months than now. Many of the 37 per cent who expect them to be smaller qualify that expectation by pointing out that they deliberately will seek smaller stocks. That's because nearly all the respondents

Latest Metal Supply Picture as Seen by STEEL's Quarterly Survey

(Figures are percentages of those replying to the questionnaire)

COMPONENTS	INVENTORY POSITION					BEST DELIVERY				
	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days
C. F. bars, over 1″ (This quarter)	..	30	65	5	..	6	25	32	19	18
(Last quarter)	..	35	59	6	..	31	31	15	8	15
C. F. bars, under 1″	..	22	72	6	..	13	33	34	14	6
	..	36	36	28	..	35	36	22	7	..
H. R. alloy bars	6	14	47	33	..	..	20	37	29	14
	6	20	60	7	7	23	8	15	8	46
H. R. carbon bars, over 1″	..	31	39	28	..	7	34	16	29	14
	3	32	42	13	10	12	29	9	15	35
H. R. carbon bars, under 1″	..	31	49	17	3	16	32	12	25	15
	..	20	50	18	12	19	39	10	13	19
H. R. sheets, strip	3	38	46	7	6	4	30	14	17	35
	6	37	46	8	3	12	15	15	17	41
C. R. sheets, strip	5	16	68	11	..	5	11	26	25	33
	6	29	47	12	6	12	11	13	35	29
Galvanized sheets	17	33	25	25	..	18	9	10	44	19
	18	26	29	9	18	42	8	17	25	8
Plates, light	..	34	53	10	3	16	8	17	37	22
	3	12	63	16	6	17	23	3	27	29
Plates, heavy	..	39	52	9	..	12	5	29	34	20
		17	56	15	12	7	26	13	19	35
Structural shapes	..	36	50	14	..	4	29	30	22	15
		36	26	24	14	4	26	11	22	37
Manufacturers' wire	11	13	50	14	12	12	50	13	25	..
		36	46	9	9		45	11	11	33
Welded tubing	7	14	46	20	13	8	25	41	17	9
	6	11	33	44	6	13	34	13	21	19
Seamless tubing	7	9	51	25	8	..	19	72	..	9
	20	26	20	28	6	6	44	12	19	19
Stainless sheets, strip	12	13	38	37	..	..	24	..	26	50
	25	25	42	8	..	10	20	31	20	19
Pig iron (foundry)	11	..	67	22	..	12	75	13	..	..
		31	57	6	6	6	65	18	6	5
Copper, brass mill prod.	10	20	50	20	..	20	30	40	10	..
		44	45	11	..	33	46	11	11	..
Aluminum products	10	..	72	18	..	..	36	27	19	18
	10	20	61	9	..	30	30	12	20	8
Copper wire, cable	12	13	75	..	..	12	50	25	..	13
		19	61	20	..	20	20	41	19	..

foresee faster deliveries on materials in another quarter. As one small consumer of all three metals puts it, "I think by that time it will be fairly safe to cut my inventory since I'll be able to count on warehouses for prompt shipment."

AISI Group Honors Four Men

The General Technical Committee of the American Iron & Steel Institute met in Cleveland on Apr. 23 to honor four retiring members who had an aggregate service on the committee of over 60 years.

Honored members were: C. A. Burkhalter, Wheeling Steel Corp.; J. H. Need, Inland Steel Co.; C. A. Scharschu, Allegheny Ludlum Steel Corp.; and T. G. Stitt, Pittsburgh Steel Co. Both Mr. Burkhalter and Mr. Sitt served for 19 years.

New Jet Scheduled

An "attack" version of the present twin-jet F7U-3 will be produced by United Aircraft Corp. at its Chance-Vought Aircraft Division in Dallas. The Navy says it has issued a letter-of-intent to United to work out prelimary plans for the jet, with a production contract to be negotiated when cost data are assembled.

Erratic prices threaten zinc output as . . .

inc Users Plead for Stability

Consumption in '53 seen higher but price fluctuations hurt business. Sliding scale tariff in issue as producers are beset by price weakness and growing imports

MERICAN metalworking indus-es will use more zinc this year an ever before.

Markets for this metal have not ne to pot in spite of the price id and weakness of the last year. drop in European consumption llowed by dumping foreign ton-ge onto the U. S. market knocked e props from under prices.

Low Spirits — Domestic mine vners are not happy about the ice of zinc dropping to eleven nts. While consumers welcomed price decline, they want stability prices. Members of the American nc Institute in annual meeting St. Louis last week were minded that zinc varied in price times in 42 weeks from June 1, 52 to Mar. 28, 1953.

Output Down—Russel B. Caples, tiring institute president, asserts at low prices of zinc have low-ed domestic production of ores d could result in a further dras-decline. "Many mines are oper-ing solely because they lose less oney by operating than by shut-g down and maintaining their operty," Mr. Caples explains.

Agreement is lacking on how to solve the price problem. Several medial bills have been introduced in Congress. One is the Simpson Bill, H. R. 4294, which would levy a "tax" on lead and zinc imports whenever the price in the U. S. falls below 15.5 cents.

Economic Level?—U. S. miners naturally are in favor of a sliding-scale tax, but custom smelters, who get concentrates from abroad, have attacked it. Simon D. Strauss, vice president, American Smelting & Refining Co., joined Jean Vuilleq-quez, American Metal Co. Ltd., in denouncing the plan, saying "the cure is worse than the disease." Users yearn for stability, but question whether the 15.5 cent price is "an economic level." Diecasters joined the anti-tariff camp, too. W. J. During, executive vice president, Precision Castings Co. Inc., Syracuse, N. Y., said the zinc industry would be "committing suicide" by pegging prices at 15.5 cents (see p. 160).

With lower prices for zinc and fading away of government controls, the outlook is for record consumption in the U. S. of 972,000 tons of slab zinc this year, says Howard L. Young, assistant sales manager, American Zinc Sales Co., St. Louis.

Leftovers—Supplies available to consumers will consist of about 940,000 tons from U. S. smelters this year and 180,000 tons of imports. The surplus will go partly into government stockpiles and exports, leaving an excess of about 76,000 tons.

Helping point toward record consumption of slab zinc is the expected record output this year of 275,000 tons of zinc die castings, compared with 204,000 last year.

Sales Possibilities — Despite inroads made by other materials on the galvanizing industry in the last 12 years during shortages of zinc and steel, the potential market for galvanized products is the largest in history, thinks B. P. Finkbone, product engineer, Armco Steel Corp., Middletown, O. Three large expanding markets for zinc-coated sheet steel are construction, home appliances and agriculture.

Newly-elected Zinc Institute president is Marshall L. Havey, assistant to the president, New Jersey Zinc Co., New York.

Delta Reports Record Orders

March orders for power tools made by the Delta Mfg. Co. Division, Rockwell Mfg. Co., Milwaukee, were the largest in the company's history, says W. F. Rockwell Jr., president. The previous record of March, 1951, was topped by about 7 per cent. He said the increase was largely the result of a "snowballing do-it-yourself trend" throughout the country. (See STEEL, Apr. 27, p. 63.)

Mr. Rockwell also told a directors' meeting that there are bright prospects for immediate Washington approval of four pipeline construction projects which would result in increased sales of the company's lubricated plug valves and gas meters and regulators.

Welding Group To Meet May 8

The Cleveland Section of the American Welding Society will hold its 14th annual symposium program on May 8 at the Allerton Hotel, Cleveland. The program will consist of educational exhibits, a technical session and a banquet.

The symposium will be dedicated to William Loveman, president of Burdett Oxygen Co., Cleveland, who is celebrating his thirtieth year in the welding industry.

Spotting Trends . . . in Trailer Facts

Dollar Sales in 1952 . $319,917,900
(Up 29 per cent over 1951)

Units Sold in 1952 83,054
(Up 25 per cent over 1951)

People living in trailers . 1,800,000
(Should reach 2 million by Sept., 1953)

MOBILE HOMES have rumbled their way into a permanent, though ambulatory, position in American business. Trailer facts in the table above illustrate the dollar-and-cents growth of the industry. But, behind these figures is a transition in the use of the utility suites on wheels that is changing the outlook of manufacturers and that bears watching as an outlet for all types of household products.

House trailers began as the almost exclusive luxury of the vacationist. They are now the necessity of a mobile population. In 1937, says the Trailer Coach Manufacturers Association, vacationers bought $17 million worth of house trailers and only $2,160,000 worth in 1950.

Census Report — On the other hand, 45 per cent of the persons living in mobile homes in 1950, about 675,000 persons, were using them as temporary housing; 35 per cent, or about 525,000 persons, were those working in "mobile occupations;" and 15 per cent of trailer folk were 225,000 retired persons.

Businessmen, themselves, took 5 per cent of 1952's total sales, or some 4200 units, for business, professional or special purposes.

Potential Markets — The mobile home, as a permanent residence, requires many more household items than the older vacation-type units needed. Actually, the major portion of the dollar volume of supplies to the industry is accounted for by interior household equipment. Beds, chairs, refrigerators, kitchen ranges, sinks, bathroom equipment, heating units, electrical and plumbing fixtures and, within the last year, air conditioning units and TV, all go into mobile homes. Sometimes they're standard units, more often they're specially designed for trailer use.

Other than interior equipment, trailers consume considerable quantities of steel and aluminum for chassis and body parts. A Housing & Home Finance Agency survey of 1950 estimates industry-wide use of steel in chassis was 18,560 tons; for prefabricated body parts, 1906 tons of steel, 694 tons of aluminum; and for siding and roofing, 4300 tons of steel sheet and 13,400 tons of aluminum sheet.

Reverse Trend?—While defense demands dictated a shift to aluminum sheet early in the present mobilization period, Leonard Dexter, general manager, Liggett Supply & Equipment Co., Elkhart, Ind., large supplier of running gear for house trailers, says, "I would say that aluminum is on the decrease in the trailer industry as more and more manufacturers are using steel siding rather than aluminum."

Of the nearly 200 firms making house trailers, nearly half of them are on a marginal basis. Many of the latter are not expected to survive the transition in mobile homes. As more people regard trailers as their only and permanent reside the accent falls heavily on be engineering and design of coaches. Casualties will come firms unable to meet higher sta ards and greater comfort dema ed by the consumers.

Still, established firms exp another fine year in 1953. "We pect a very good year," says Jos R. Duncan, sales manager, T wood Trailers Inc., Trotwood, "We'll just have to sell harder do it."

Broker Guarantees Shipments

Donald Marks Steel Co., Cle land, and London Guarantee & cident Co. Ltd. have worked an agreement whereby all p chases of steel by the former guaranteed prompt payment. Marks, a buyer of surplus st acts as a broker, shipping consi ments from a company which surplus stocks to others who in need of the steel.

The shipment is guaranteed be as represented. If it is n Marks Steel will return it to original owner and pay transpor tion both ways. If it is as rep sented, and the buyer does not p immediately, the insurance co pany will cover the cost of steel for the seller.

Westinghouse Has Good Quar

Westinghouse Electric Co Pittsburgh, had a better first qu ter this year than last, and remaining three quarters sho make an even better show Gwilym A. Price, Westingho president, told the Sales Manag Association at their annual din in Philadelphia.

Sales for the first three mon of 1953 were about 18 per ahead of the like period a ago. Earnings were up abou per cent, Mr. Price said.

He stated that Westinghouse not expect any serious probl to be created by the cutback stretch-outs in military spend

Steel Management Changes

Administrative changes are ing place at Youngstown She Tube Co., Youngstown, and In Steel Co., Chicago.

At Inland, Edward L. Ry

fired as chairman of the board. rence B. Randall, formerly pres- nt, was made chairman while tinuing as chief executive of- r. Joseph L. Block was elected sident after serving as execu- e vice president. Mr. Ryerson l continue as a director and irman of the executive commit- of the board.

Y S & T announced four ad- ncements. Walter E. Watson, st vice president and a director, s elected to the executive com- tee. Alfred S. Glossbrenner, vice sident in charge of operations, s elected to the board of direc- s. Lew E. Wallace, general man- er of sales, will be assistant vice sident, while Myron H. Watkins, sistant general manager of sales, s appointed general manager of es.

lifornians Expanding Plants

Electronics firms in the 40- ile area between San Bruno and n Jose, Calif., apparently are t bothered by the stretch-out in ilitary spending, because they e continually expanding their cilities and work force.

The heavy concentration of nall producers has a combined cklog of about $80 million in avy contracts and about the me amount in other armed rces contracts. Present employ- ent figure for the San Francisco ninsula industry stands at ap- roximately 5000 persons.

ethlehem Aids 45 Colleges

Bethlehem Steel Co. has named 5 universities and colleges in the nited States to benefit in a pro- ram of financial assistance. The ssistance will be offered in pro- ortion to the number of men who nall be selected by Bethlehem in s annual training program for ollege graduates. The amount of ayment for each graduate will be 3,000.

Bethlehem normally takes more an 100 men each year in its ollege graduate training program. he financial assistance plan will e in effect this year, and it may e extended later to additional ivately endowed colleges and niversities, says Eugene G. Grace, airman of Bethlehem's board.

Industrial Seals

Research Campaigns Find New Uses for Oil, Grease and Dust Seals

A RETURN to normal civilian operations—good but not as prosperous as in the past two years—is the outlook among oil, grease and dust seal manufacturers. They predict little change in prices or demand, which remain steady. A STEEL survey indicates a trend among the 85 seal producers towards spurring their civilian sales campaigns.

Predicting increased competition during 1953, most firms are intensifying research and development programs. Goals are to solve limitations of seals. New materials must be developed for the mining and chemical industries to withstand acids and chemical solutions. Nonmetallic seals lose their effectiveness at high temperatures and pressures. Synthetic rubber seals develop severe wear at temperatures above 300 degrees.

High Pressure — Research to satisfy a more discriminating civilian market has resulted in such products as a heavy duty mechanical shaft seal, designed to withstand pressures up to 1000 pounds per square inch. Crane Packing Co., Chicago, manufactures this seal. High temperatures in oil well drilling require the use of all-metal seals, manufactured of steel, bronze and brass.

Johns-Manville Corp., New York, has designed a special Clipper Seal to provide bearing protection in steel, plastic and rubber mills where high abrasion factors, temperatures as high as 450 degrees and low pressures are encountered.

Steady Sales—Despite a levelling-off from peak sales in 1952, most firms are finding a steady demand from customers in the mining, chemical, earth moving and electrical equipment industries. Automobile producers, always leading customers, are stepping-up purchases.

Many consumers continue to buy seals from small producers with one to 25 workers to secure a job of known quality with frequently lower prices and quicker delivery. Alpha Products Co., Cleveland, predicts steady business for the small producer who can fill an order quicker than his large competitors.

Independent companies manufacturing special seals supply producers of refrigerators, gas pumps, water coolers and similar equipment in which one fluid must be kept away from another or segregated from materials. Alpha Products designs seals with unusually close tolerances for gear boxes of industrial rayon processing equipment, where oil and lubricants are harmful to materials.

Seal Requirements—Continuing success of small producers undergoing increased competition this year results from ability to satisfy one of many functions demanded of seals. In slabbing mills seals must operate under high temperatures, pressures and shock loads.

Efficiency under high speed operation is required in oil drilling rigs while seals in aviation equipment must conform to narrow tolerances. Bearings in machines manufacturing silicon carbide wheels must be covered with a seal capable of keeping out minute silicon carbide particles.

Outlook — Industry representatives say these multiple uses of seals are a guarantee against a future decline in production. Optimistically they point to a considerably improved supply situation in metals. Even nickel steel, very hard to obtain last year, is now more easily secured.

EARNINGS OF STEEL COMPANIES

	Net First Quarter Sales		Net First Quarter Income	
	1953	1952	1953	1952
U. S. Steel Corp.	927,925,909	864,168,272	49,375,958	43,534,212
Bethlehem Steel Corp.	.....	.....	30,961,033	18,926,045
Republic Steel Corp.	292,918,852	261,599,663	13,779,049	11,759,513
Armco Steel Corp.	.....	.....	7,767,045	8,014,638
Jones & Laughlin Steel Corp.	158,914,000	138,429,000	5,642,000	4,711,000
Youngstown Sheet & Tube Co.	140,564,614	125,021,321	6,958,975	7,038,787
Inland Steel Co.	135,855,115	123,652,436	6,805,150	6,936,470
Allegheny Ludlum Steel Corp.	68,686,523	52,751,596	2,098,370	1,459,813
Wheeling Steel Corp.	53,211,447	51,378,964	3,251,388	2,782,208
Sharon Steel Corp.	46,748,804	39,854,414	2,051,826	1,370,802
McLouth Steel Corp.	.....	.....	1,444,415	1,008,352
Colorado Fuel & Iron Corp.	.....	.....	2,177,372	1,381,202
Granite City Steel Co.	21,796,409	15,945,825	1,340,146	820,504

Steel Sales Soar

Possibility of still heavier labor costs and taxes threatens profits earned by higher sales

STEEL companies are taking great strides toward sales records this year, but net earnings are not following at the same brisk rate and may fall even lower. The possibility of increased labor costs now threatens company profits. United Steelworkers of America filed notice last week that it would reopen contracts with about 80 steel companies.

Steelworkers are aiming for a wage increase of about 10 cents an hour, although they haven't yet admitted it officially. The union will threaten a walkout in coming parleys, but the odds are for a peaceful settlement.

Sales Gains—First quarter steel company statements announced last week showed sizable gains in net sales over the same quarter one year earlier. Striving to recoup their losses in strikes last year, steelmakers are showing progress, but they still have far to go. All major steel companies except Kaiser Steel Corp., Oakland, Calif., made lower earnings in 1952 than in 1951 (See STEEL's analysis of the steel industry, Apr. 20, opposite p. 74.).

Taxes and labor costs are making especially heavy inroads on net income in three other companies which reported a decline this year in net first quarter income (after taxes), as compared with last year's figures.

Lower Profits—Inland Steel Co., Chicago, reported that current earnings, at the rate of 5 per cent, "reflect the inadequacy of current steel prices in relation to the high level of tax rates, wage rates and costs of goods and services purchased." Inland's net income during the first quarter this year was $131,000 below the figures a year earlier, although sales were more than $12.2 million higher.

At Youngstown Sheet & Tube Co., Youngstown, the profit margin on sales similarly dropped although sales increased. Profit was only 5 per cent in the first quarter as compared with 5.7 per cent for the first quarter of 1952.

Armco Steel Corp., Middletown, O., had net earnings equal to $1.49 a common share for the first quarter this year. Increased depreciation and amortization charges were reported responsible for the decline from net earnings of $1.54 a share for the like period of 1952.

Move Over, Sears, Roebuck

SHELLAC, arsenic, toothpicks, sapphires, paper from Japan. . .

Merchandise for a big department store? Guess again. These are some of the 100,000 different items purchased by Westinghouse Electric Corp., some from spots as far away as Madagascar.

It takes 900 buyers spending $700 million a year to keep the Westinghouse production larder stocked. They buy from 15,000 suppliers, issue purchase orders at a rate of 700 every working hour.

A few items from one of the world's largest shopping lists: Sand—11 kinds, solder—17 kinds, shellac—12 kinds, hickory wood — picked from the standing tree, glass-makers' arsenic—40 tons a year.

Shift in Gears

More gearmakers turn to package units like speed reducers to round out their lines

GEARMAKERS are turning more and more to package gearing units such as speed reducers to round out their production picture.

A lot of new faces are showing up in the fractional horsepower and variable speed drive fields. The aircraft industry with its demand for extreme tolerances, high weight and high power from ever smaller gear packages is challenging the design pioneers.

Near a Record—Enclosed gear drives account for a lot of the brightness in the gearmakers' sales picture for 1953. Business looks as good as 1952, a next-to-record year, and perhaps 5 per cent better, according to John Sears, executive secretary of the American Gear Manufacturers Association, Pittsburgh. The record year was 1951.

Factors lifting the face of the old-time gear box are industrial requirements for higher speeds, quieter operation, less maintenance, smaller size and pleasing appearance.

Variety—The infinite variety of gear units continues to be the plague and salvation of the industry. Boston Gear Works Inc., Quincy, Mass., for example, lists 39 stock speed-reducer models each available in at least five different gear ratios. Horsburgh & Scott Co., Cleveland, can make up a speed reducer anywhere in the range for 2-to-1 to 10,000-to-1. Standard units are available for mounting in almost any position. Gear units are so diverse that a manufacturer is fortunate if he sells as many units in a year as the number of different types he lists in his catalog.

Trying to do something about the problem of variety is the American Gear Manufacturers Association, which has set up gearmotor standards for such variables as shaft size, shaft length and height from mount, input and output speeds, horsepower capacity and type of load with the hope of getting competing manufacturers to produce completely interchangeable items.

Diemakers get ready for competitive days ahead as . . .

Tool & Die Market Goes Civilian

DEMAND from manufacturers of civilian goods passed defense business in the tool and die industry within the past month and a half, reports the National Tool & Die Manufacturers Association.

Six weeks ago, tool and diemakers' business was split 80-20 in favor of defense work, but today the balance has shifted to 60-40 in favor of civilian goods. In Detroit, Cincinnati, Milwaukee and Providence, R. I., armaments orders constitute only about 25 per cent of the business of tool shops.

Optimistic—Philip R. Marsilius, vice president of Producto Machine Co., Bridgeport, Conn., told the annual meeting of the association in Washington that the activity in civilian goods will keep his industry busy through 1954. It stems from the return to intensive competition among manufacturers and attempts to meet that competition through new design.

Some shopowners reported that they would turn to civilian business completely except that they feel they must retain some defense work to protect their eligibility for priority on materials and facilities in short supply.

Word of Caution—J. J. Demuth, St. Louis, former president of the American Society of Tooling Engineers and tool and die consultant to the National Production Authority, warned that the special tooling industry must be kept healthy so that in case of national emergency it can swing right back into defense production.

The association went on record in favor of revision of tax laws to give special consideration to small businesses. Alfred Reinke, president of the association, also proposed that the minimum for renegotiation of tool and die shop contracts should be raised from $250,000 to $500,000.

Cramet Wins Tax Write-off

Cramet Inc., Nashville, Tenn., received a tax write-off on 90 per cent of $25,740,000 for a five-year project to make titanium sponge.

Cramet, a subsidiary of Crane Co., Chicago, is negotiating with the Defense Materials Procurement Agency for a financial advance to be repaid in titanium sponge. A DMPA spokesman said Cramet's capacity will be about 6000 tons of sponge annually, (See STEEL, Apr. 6, p. 87).

CHECKLIST ON CONTROLS

Materials Orders

NICKEL—Amendment of Apr. 24, 1953, of Schedule A of NPA Order M-80 adds about 40 groups to the list of products for which the use of critical supplies of nickel is prohibited. It also adds a separate list prohibiting use of permanent magnets containing nickel for special applications such as pinball machines. Amendment was effective Apr. 24.

PLATINUM—Revocation on Apr. 30, 1953, of NPA Order M-54 removes all controls from platinum.

CRYOLITE—Revocation on Apr. 30, 1953, of NPA Order M-99 removes all controls from cryolite.

NPA Regulation

INVENTORY — Revocation of NPA Regulation 1 on Apr. 30, 1953, removes all controls from inventories.

Controlled Materials Plan

INVENTORY—Revocation of CMP Regulation 2 on Apr. 30, 1953, removes all inventory controls from controlled materials.

Appointments in Washington

Edward C. Naughton was appointed director, Electrical & Power Equipment Division, Industrial & Agricultural Equipment Bureau, National Production Authority.

Roland R. Hughes, vice president, National City Bank, New York, was named assistant director of the Bureau of the Budget.

Raymond Davis, Seattle, was named assistant secretary of the treasury.

Marvin C. Nichols, Ft. Worth, Tex., was appointed commissioner of reclamation.

Kenneth L. Vore was appointed director of transportation, Department of Defense.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Milling Machines	Moore Machinery Co., San Francisco
Turret Lathes	Robert R. Stephens Machinery Co., St. Louis
Drill Presses, Radial	Bryant Machinery & Engineering Co., Chicago
Shells, 105 mm	National Pressure Cooker Co., Eau Claire, Wis.
Boosters	Badger Meter Mfg. Co., Milwaukee
	Robertshaw-Fulton Controls Co., Greensburg, Pa.
Metal Parts for Boosters	Detroit Brass & Malleable Co., Detroit
Aircraft Engines	United Aircraft Corp., E. Hartford, Conn.
Electron Tubes	Eitel-McCullough Inc., San Bruno, Calif.
	General Electronics Inc., Paterson, N. J.
Rectifiers	International Rectifier Corp., Los Angeles
Generators	General Electric Co., Schenectady, N. Y.
Servo Motors	Doelcam Corp., Newton, Mass.
Parts for Pumps	Worthington Corp., Harrison, N. J.
Winches, Double Drum	Skagit Steel & Iron Works, Sedro Wooley, Wash.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Defense department spokesman promises no sharp curtailments in development of the mobilization base. Industrial potential will remain in readiness for all out war

REPORTS of an impending reduction in the industrial mobilization base have been grossly exaggerated, says W. J. McNeil, assistant secretary of defense.

He states, "During the phase of building production capabilities, some elements of the program will inevitably get out of balance. In future months, we intend to make day-to-day adjustments necessary to keep the program in balance and achieve maximum efficiency.

Less Active Production — "As needs of the mobilization reserve are met and production reaches a plateau, there will be a decrease in plants engaged in active production of military end-items. This will permit elimination of less efficient high-cost producers whose productive capacity was temporarily needed during initial build-up stages.

"There has been speculation that the Department of Defense is planning to sharply curtail the mobilization base so laboriously built up. No major change or reversal of this basic policy is contemplated. Adjustments, however, will improve the degree of industrial readiness."

Opinions Change — This statement reflects a change in Pentagon thinking to accord with a tentative agreement by President Eisenhower's Mobilization Board to keep many plants in readiness for all out war. The board's conclusions reflect some concessions to Secretary Charles Wilson's insistence that efficient use of armament plants is imperative if the Defense department's budget for fiscal 1954 is to be reduced by $4 billion to $5 billion.

While no decision has been made on publicizing detailed findings of the board, a spokesman announced fixing of three goals: Planning the largest balanced military program feasible from the standpoint of industrial capacity; creation of an industrial potential to cope with a full war emergency, and economy in expenditure of resources and the burden which industry is called on to carry.

Tasks Ahead — Much planning must still be done to freeze programs for all military end-items and thus determine the extent to which plans for creating standby and shadow plants will be carried out. The Munitions Board is trying to revise by June 30 its list of machine tools to be procured over the next three years for new military production programs. Until this list is in fairly good shape, the National Production Authority will be unable to act on proposals for new plants to produce "elephant" machine tools.

Ax Aimed at Spending . . .

Another meat-ax assault on federal spending occurs in the second money bill for fiscal 1954 to come from the House Appropriations Committee. Secretary of the Interior Douglas McKay cut the Truman request for his department by $123 million, and the committee increased the cut to $202 million. Truman's request was for $607 million; the committee approval is for $405 million.

In cutting the Bureau of Reclamation request for $231 million to $133 million, the committee knocked out "new starts" on transmission lines for government power, saying the government should build necessary lines only after private industry has had a chance at them.

In trimming the Mines bureau from its requested $29 million to $18.7 million, the committee adopted Secretary McKay's recommendation that the government's demonstration gasoline - from - coal and gasoline-from-oil shale plants be shut down. When the bill got to the House floor, the representatives promptly reinstated the latter but decided to accept the committee's recommendation on the former.

PERENNIAL SEAWAY PROJECT
. . . action possible this year

Seaway Action Planned . . .

The Senate may act this year on the long-debated St. Lawrence Seaway if Congress returns for a fall session—a prospect that is likely.

Sen. Alexander Wiley (Rep., Wis.) reported this possibility following receipt of a letter from President Eisenhower recommending participation with Canada in the project.

The President said he would take up with Congress the extent of American participation in the project. The National Security Council says the seaway is in the interest of security.

New Tasks for Pipe . . .

A new use of galvanized steel pipe has been developed by the Agriculture Research Administration. For cooling stored grain, to keep it from fermenting, lengths of 6-inch galvanized steel pipe, with the bottom part perforated with hundreds of slit openings, are placed vertically in the grain. A ⅓-horsepower fan mounted in the top end of the pipe draws from 50 to 100 cubic feet of air per minute through the grain and discharges it outside.

To give the new method a thorough tryout, the Production and Marketing Administration is buying 1000 of these tubes.

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This Morgan shear is made in four sizes to cut cold bar up to 6″ diameter or other shapes of equivalent cross section area. It shears merchant bar, rounds, flats, angles and other shapes quickly and accurately. Auxiliaries to the shear, such as electrically operated gauges, air or hydraulically operated stops and hold-downs, with easy to reach finger-tip controls, result in less operator fatigue.

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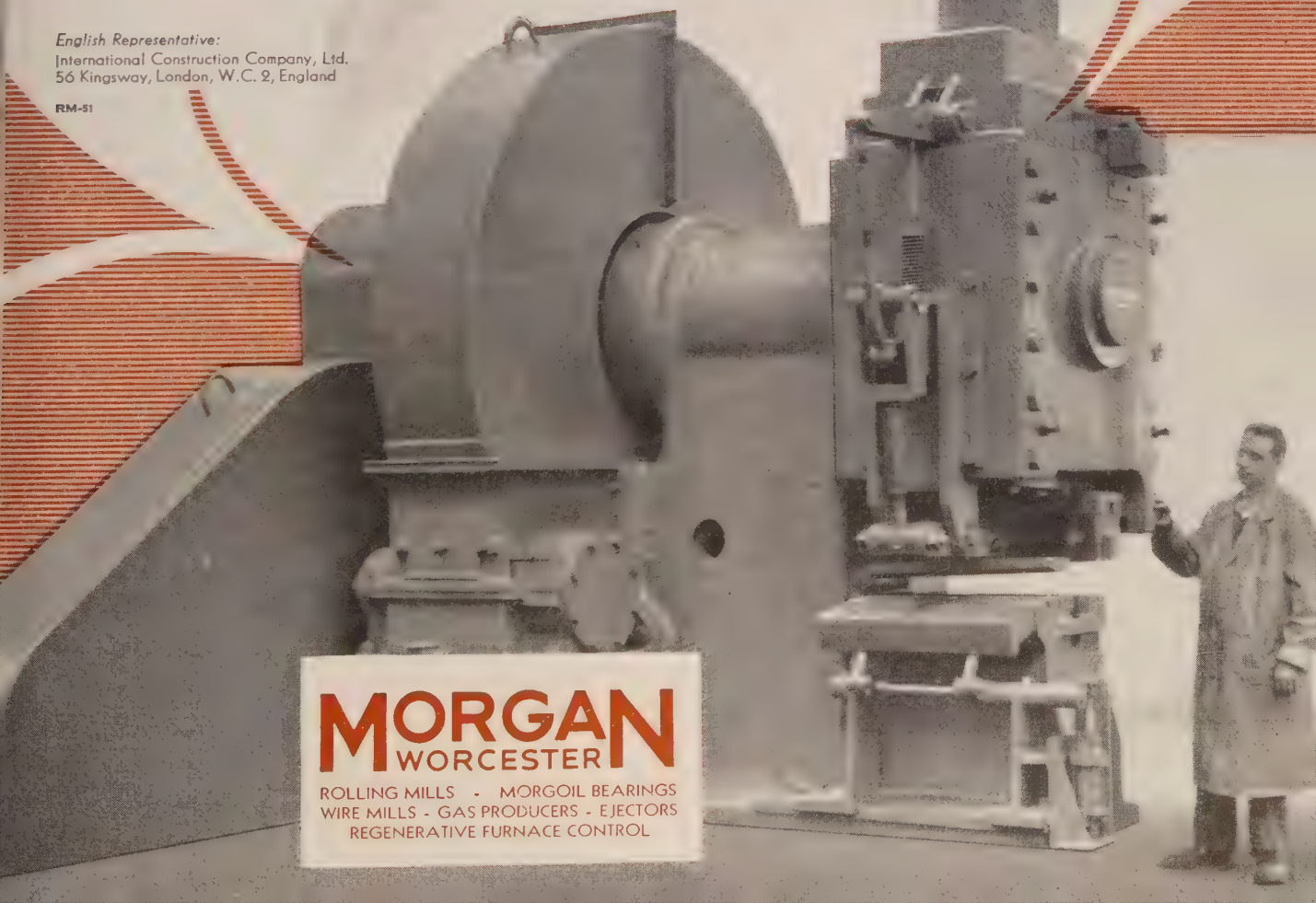

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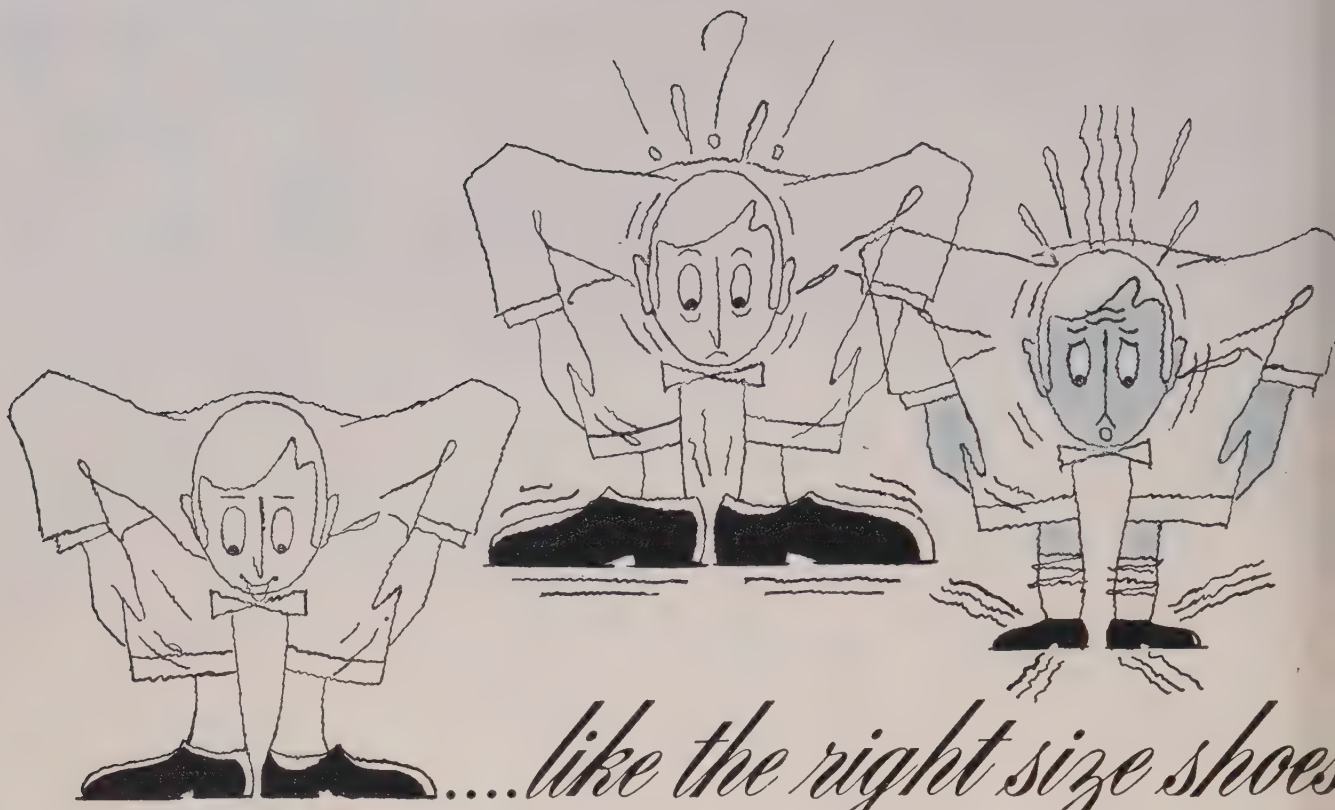
ROLLING MILLS - MORGOIL BEARINGS
WIRE MILLS - GAS PRODUCERS - EJECTORS
REGENERATIVE FURNACE CONTROL



....like the right size shoes

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is tailored to your need

Have you ever purchased shoes that were either too tight too large? Are you doing the same thing with your cold roll strip steel needs? Both can cause you trouble. Both may lo fine but not give you the desired result.

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In steel, as with some other products, the first cost is always the most important. If by using a specialized product su as CMP THINSTEEL, your labor costs and your machine time c be reduced, the steel cost itself in any particular end produ may not be the significant item of cost. If your fabricati operations can be made comparatively trouble-free by the use a cold rolled strip steel product made to fit your own particu requirement, then CMP THINSTEEL has something of value offer you. A comparative test is the means by which these val can be demonstrated. Are you interested?

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Washington Officials See Lower Tariffs

President Eisenhower objects to limitations on trade agreement powers. New commission will study means of bettering trade relations with rest of world

WATCH for the trend in tariff rates in the immediate future to go downward. That is the only inference to be drawn from the overriding foreign trade picture, in the opinion of government officials.

President Eisenhower added emphasis to the feeling when he stated that there are certain items in the Simpson bill (H.R. 4295) which he couldn't possibly accept. He was referring to the provisions which would virtually kill the authority of the administration in negotiating new trade agreements. The bill would require that he follow the "peril-point" recommendations of the Tariff Commission. It also would make it mandatory for him to invoke the so-called escape clause when the commission finds that a domestic industry is being damaged or threatened with damage through the operation of a reciprocal trade agreement.

Rep. Richard M. Simpson (Rep., Pa.), author of the bill, indicated he may be willing to drop the mandatory clauses.

No Soft Touch—Since the first escape clause applications were filed in 1948, 45 trade groups and firms have applied to the commission for modification of tariff cuts under trade agreements. The commission in turn referred five cases to the President (Harry Truman) with recommendations for tariff adjustments, and Mr. Truman carried out only three of those.

Even though the Tariff Commission has been cautious in handling its powers under the escape clause, the President does not believe it has the background for making rate determinations consistent with good foreign relations.

Another Commission—The situation is a complicated one, and the commisson which President Eisenhower is about to appoint to study it must consider several things. First of all, our dependence on foreign sources for many vital materials is real and increasing. (For more on this, see STEEL, Apr. 13, p. 73.) Then there is the trade-instead-of-aid concept. There will have to be some determination of proper relationship between our gifts abroad—both military and economic—and our paying foreign trade.

Part of the story is the size of the dollar gap. The rest of the world has received U. S. goods worth $34 billion more than they have sold here in the seven years from 1946 to 1952. The U. S. has balanced that off with about $31 billion in aid and use of about $3 billion of gold and dollar reserves of other countries. That can't continue forever. The real problem is how to get more dollars into foreign countries, and the answer is a big increase in imports.

Whither Machine Tool Imports?

Many metalworking men are watching for the Commerce department's Foreign Trade Report 110, Imports of Machine Tools into the U. S. An uptrend which started in July, 1951, and continued through 1952 except for a small reversal in April, is expected to continue into 1953. In 1950, the total imports in this Commerce report category totaled $2.3 million; in 1951, $13.7 million; and in 1952, $49,788,000.

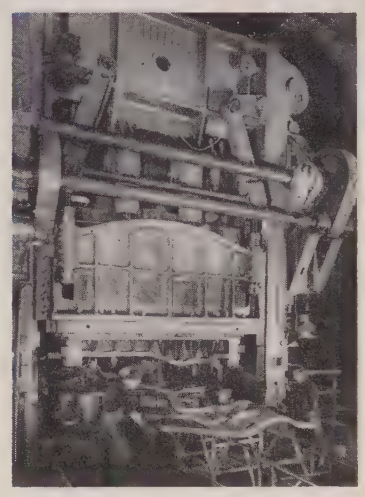
Albanian Steel Mill Started

Albania has started construction of a small electric-furnace steel plant. The annual capacity will be 20,000 tons of stainless steel and special foundry steel to be used mainly for strategic items needed by Russia.

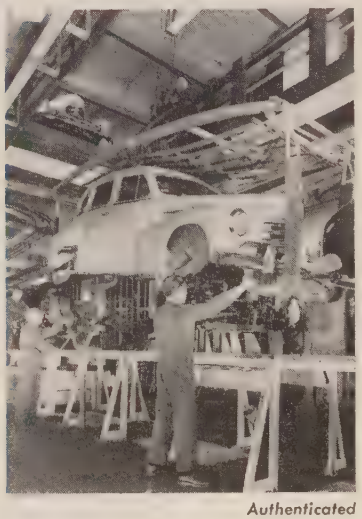
Steel Plant Proposed

Six large Japanese steel companies have approached the Thailand government with a proposal to build a steel mill there. Already approved in principle is a plan for combined Thai-Japanese mining and smelting of iron ore in Thailand, with the Thailand government holding 51 per cent of the shares.

Engine blocks roll off the line . . .



Pressed parts output rises . . .



Authenticated

Result: More German Cars

GM's Adam Opel car plant in Russelsheim, Germany, is turning out autos in great numbers symbolic of West Germany's recent rapid industrial recovery

MAKING SALES TRAINING *Realistic...*

Trainees at Carborundum Co. learn their jobs through dry-run practice

A trainee interviews Advertising Manager A. W. Cowles, left, on company activities and policies

SALES TRAINING is more than just an often-heard phrase at Carborundum Co., Niagara Falls, N. Y. It is a byword in the sales training department, which has revamped its program to fit into today's complex selling picture.

Much of the emphasis of the new program is still on product knowledge, as it was in the past. With about 35,000 products on the sales lists, Carborundum believes it is vital for company salesmen to have an exceptional amount of training in this line.

More Than That — But product knowledge alone is not enough. It is even more important that such knowledge be expressed by the salesman in terms of what the product will do for the customer. Under the usual training pattern—approach, presentation, asking for the order, etc.—a trainee did not get the "feel" of selling his product to the customer, company officials believed. He got that by the process of osmosis from his fellow salesmen and in the field.

Therefore, in the summer of 1951, the sales training department of Carborundum set up a new program to remedy that shortcoming. The training period lasts six to eighteen months depending on the trainee's objectives and previous training. The first four-and-a-half days of the week are spent in a particular department becoming familiar with its operations and products. On Friday afternoon, all trainees assemble for a sales development session under the direction of Carl H. Demmin, manager of sales training. A typical agenda for one of those sessions is:

1. Rules and policies of the sales training department.
2. Review of objectives of Friday meetings.
3. Written report review.
4. Oral reports on assignments.
5. Discussions of sales management organization.
6. Salesmanship films.
7. Sales situation presentation.

It became apparent soon after the program began in the summer of 1951 that the sales situation feature was evolving as the outstanding phase. Therefore, it began getting more attention and Mr. Demmin found that many of the other points of the agenda could be worked into the sales situation rather than in lecture form.

Curtain—The background information relative to the situation is presented to the group in such a manner that all can visualize the position of the buyer as well as the seller. During the introduction to the situation, the sales training department injects instruction on preparation for interviews.

At the conclusion of those preliminaries, two sales trainees engage in an unrehearsed role-playing situation based on the established conditions. They have been given adequate notice and time for preparing independently for the situation. While the trainees act out the situation, the rest of the group takes notes on an analysis sheet.

Chalk-Talk—Later, they list the good and questionable points of the

After the buyer-seller situation is over, trainees list and discuss its good and questionable points and hear a recorded playback of the entire proceedings

W. E. Henderson, right, a Chevrolet purchasing agent, listens as a trainee tries to sell him

uyer-seller situation on the blackoard in order to get the benefit of ollective thinking. Also, they hear recorded playback of the proeedings so that the participants an review their presentation and etect flaws in diction, voice inflecon, method of presentation, tone f speaking, etc. This method leads o great improvement in technique mong the junior salesmen, Mr. Demmin says.

The role-playing assignments are otated among the trainees from veek to week, and the situations mployed are intended to cover very possible set of conditions enountered by company salesmen. While the situations themselves are ased on specific—oftentimes comlex—conditions, it is evident that he role-playing technique, by the very nature of its makeup, is somewhat restricted to the application of general principles. Furthermore, role-playing as such does not take nto account the personality of each ndividual buyer, which plays such an important part in every actual buyer-seller situation.

Stark Realism—To inject those elements into the training program, Carborundum has enlisted the aid of some of its experienced customers to act the part of the buyer. Such a case was the role enacted by W. E. Henderson, purchasing agent for the Buffalo plant of Chevrolet Division, General Motors Corp. A sales trainee was given the situation outline in advance, as was Mr. Henderson. The sale was not made, and after the performance was completed, Mr. Henderson told the group why.

The value of such experience to the trainee is obvious. He learns first of all many basic principles of selling, sometimes under genuine conditions. Moreover, it gives him the opportunity to appraise the actions and personal characteristics of the professional people he will soon encounter as a salesman. He learns to study and appraise his prospects as individuals rather than as broadly grouped classifications.

To Be Expected — Mistakes are made, naturally, by the trainees participating. These errors, whether of commission or omission, are observed by the audience and become the subject of group discussion. That impresses good and bad points on the memories of the actors and helps them perfect their techniques.

In addition to the role-playing technique, the Friday afternoon sessions also include a presentation and discussion of company activities, policies and other matters of interest. Here again, trainee participation is employed.

New Assignments—Each of the young salesmen is given the assignment to prepare a report on some phase of the company's activities. He then delivers the report to the whole group. Mr. Demmin believes the trainee will benefit from this experience in four ways:

1. He learns to arrange and conduct an interview.

2. He learns how to organize his material and to present it in an orderly manner.

3. He gains experience in expressing himself orally, because he is subject to constructive criticism from the group after delivering his talk.

4. He has acquired a knowledge of one of the important phases of company activity.

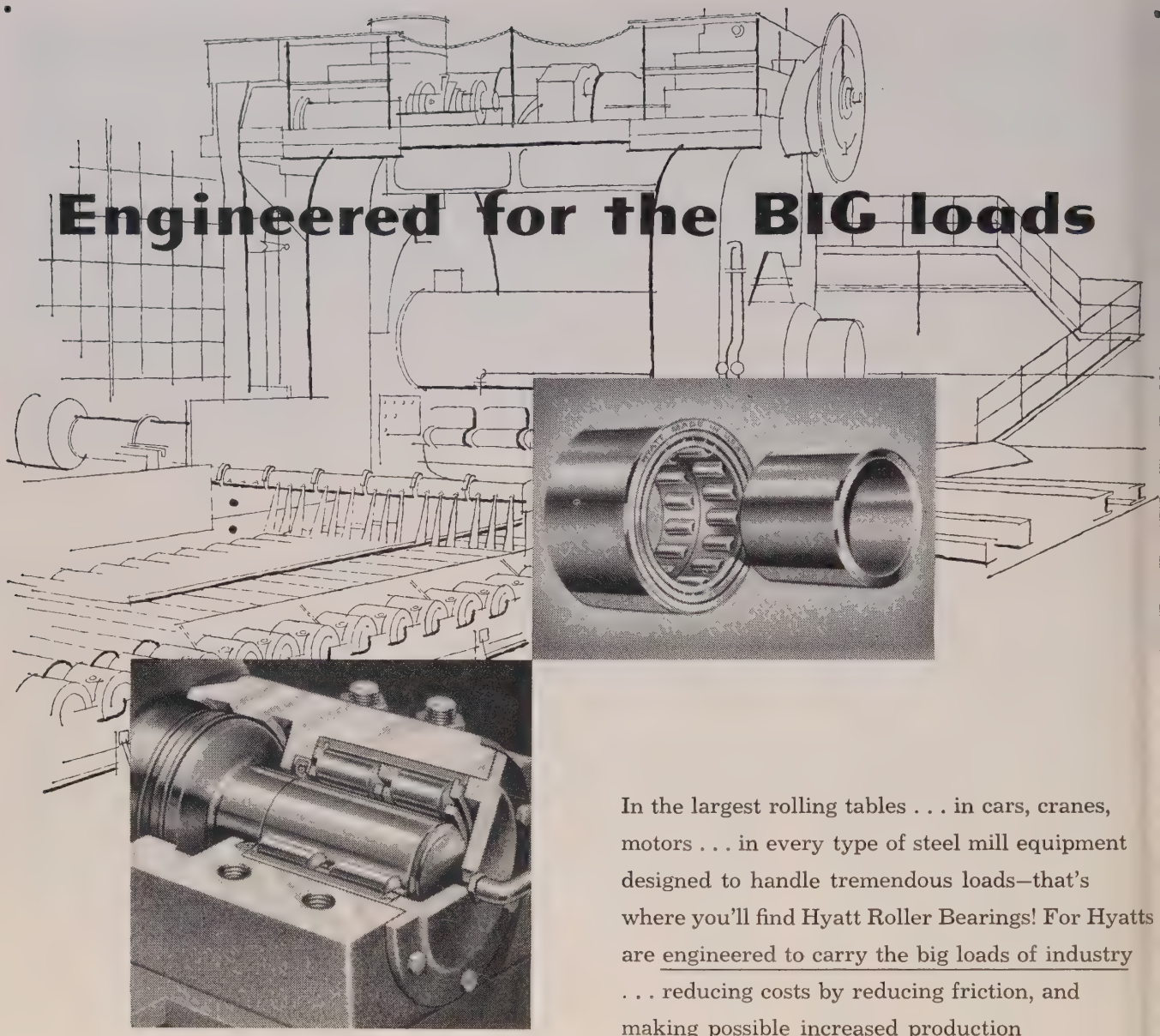
The rest of the group also profits from his report. By the time each trainee tells of his assignment, the whole group will have a working knowledge of Carborundum.

Co-operation—Top management at Carborundum has been very helpful in this program. Company salesmen and sales executives give the trainees the advantage of their experience and know-how by participating in the Friday sessions through lectures and sales situations. F. J. Tone Jr., vice president of sales, says, "The sales situation is the most effective method we have found to date for better equipping our sales trainees in the requirements of good salesmanship."

At present, the company is considering increasing still further the amount of time allotted to salesmanship training. "We devote about 80 per cent of the time to product knowledge and 20 per cent to salesmanship training," says Mr. Demmin, "but we feel strongly that a 60:40 ratio would be better."

He feels that through this program Carborundum is "sending into the field salesmen well equipped to meet the demands of competition."

Engineered for the BIG loads



Cutaway view of Hyatt application to steel mill table rollers.

In the largest rolling tables . . . in cars, cranes, motors . . . in every type of steel mill equipment designed to handle tremendous loads—that's where you'll find Hyatt Roller Bearings! For Hyatts are engineered to carry the big loads of industry . . . reducing costs by reducing friction, and making possible increased production through greater operating efficiency. Hyatt offers the most complete line of radial roller bearings available anywhere, giving designers greater flexibility in achieving maximum load-carrying capacity within given boundary dimensions. More practical design, longer bearing life and simplified assembly procedures are among many benefits which result. For new equipment or for changeovers, specify Hyatt bearings. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

ABC's of Selling to the Automakers

A. Decide which division of the company you can best serve. Most of the bigger auto firms publish a pamphlet listing their various divisions and the products they manufacture. These pamphlets are available through their central purchasing departments.

B. Write to the purchasing departments of the divisions which you feel you can best serve, describing in detail the capacity, quantity and type of equipment which you have available or the product which you manufacture. Enclose a recent financial statement and a description of other facilities such as engineering to give the auto company a complete picture of your organization and its potential.

C. You should receive prompt acknowledgment of your letter and specifications of jobs on which to quote prices within a reasonable time. When job specifications arrive, submit bids intelligently. It's amazing how many firms underestimate the tolerance level required or fail to understand delivery dates. Remember, too, that auto companies are suspicious of an unusually low price. They're looking for reliability in their suppliers and the lowest bidder doesn't always get the job.

Want to be an automotive supplier? It's a profitable—and exacting—role for many a firm, including small companies. Here are hints on how to deal with auto buyers

DETROIT

SMALL BUSINESS, numerically, is the giant among automotive suppliers these days. Chrysler Corp. reports that of its 14,000 suppliers in 1952, 80 per cent employed less than 100 persons and only 4500 were located in Michigan.

The small supplier's wedge in the automaker's door is being driven deeper, too. The auto manufacturer has learned that getting all his parts requirements from one source leaves him prone to production stoppage via the supplier's strike. In a very real way the unions are helping the small businessman get more of the eggs from the automakers' basket.

The Drawbacks—Of course, not everyone likes eggs. If you're a small jobbing shop, chances are you've heard about the automakers—the intolerant tolerances, the impossible delivery dates, the rejection of entire shipments because of a thumbprint on one piece—and all the rest. Many small suppliers figure it's just too tough to do business with big business. If you've been thinking that way, you're not entirely wrong but on the other hand you may not be entirely right.

Basically the situation is this: Dealing with the automakers is in some respects very much like dealing with the government. Right off the bat you'll find that the smallest automakers are big business and handle tremendous quantities of material every day. To do the purchasing job at all, it must be broken up into corps of experts. That means that purchasing is not only decentralized, but within the purchasing setup of each division of a large auto firm there is usually purchasing for each plant. And within the purchasing for each plant there is usually a purchaser for different classes of products.

Route Marker—It's pretty obvious that you're not going to get to first base without a road map. Most firms supply such road maps through their central purchasing departments. General Motors, for example, reports it has distributed over 85,000 copies of its booklet, "Selling to GM", which lists the purchasing departments of the various divisions. So if you come to Detroit with a brief case under your arm, you can expect to spend a couple of days traveling from one office to another before you have even found the man you need to see. Much better is the letter approach in making your initial contact as described above; and after you've located the man who doles your particular type of dollars, a personal contact will make a good follow-up.

Once you have attracted the automaker's attention you can expect plenty of it. Many firms send field men to look over your plant and ascertain just what you can do. All probe your business with a thoroughness that would do credit to a Kinsey Report, for once you get an order your failure to deliver can cost thousands of times the value of the goods in lost production. A shortage of a single part stops an entire line and the automakers work from carefully scheduled delivery rather than from inventory. The parts must be there at the appointed time and be of the designated quality—it's that simple.

Off on the Right Foot—So supply the automakers with information that will tell them just what your plant is capable of doing in your early correspondence. It will expedite getting you on the supplier lists and you'll start receiving jobs within your capacity for quotation as requirements open. You'll find the jobs are broken into different classes of tolerance on a pretty reasonable basis. Parts have to fit and the quality of the finished automobile must be maintained, but tolerances are not established just to harrass suppliers. Permissible percentages of out-tolerance pieces vary with the application. Such things as engine parts must be 100 per cent on the money while varying percentages of less critical parts will be permitted without rejection of a shipment.

To prevent trouble on the assembly line, if sample inspection shows the shipment to be substandard, the entire lot must be rejected. That means as an au-

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tomotive parts supplier you must determine the cost of the requisite quality and figure it in your quoted price. Don't try to cut corners on quality or your first order will be your last.

The automakers know what they want. You'll be dealing with experts. Give them what they desire and use your ingenuity and efficiency and you'll do all right with the automakers. As one supplier puts it, "Those who don't like to do business with the auto companies just don't like to really do business."

Car of the Week

The Cadillac Choir faced a difficult problem on a recent Sunday. The radio group was singing, "I'm an old cow hand" and the lyrics you will recall go, " . . . , cause I ride the range in a Ford V-8." Public relations men all over the country waited anxiously as the awful moment approached. They were relieved to hear " . . . , cause I ride the range in a new V-8."

New V-8's there are, but the Ford power plant will probably remain for years to come "The V-8" in the minds of most cow hands. Today's Ford engine is basically unchanged since it was introduced in the thirties and it is still a fine power plant. However, the new overhead valve job to be introduced in 1954 promises to be a worthy successor.

A one week acquaintance with a customline V-8 sedan reveals few sore spots in the last of the L-Heads. Weakest factor in the car's makeup is the Fordomatic transmission. A real down and out getaway effort is hard to distinguish from a little old lady on her way home from market with eggs, but the transmission is undoubtedly one of the smoothest going.

Perhaps most outstanding is the Ford's roadability, cornering and ride. On the open road this machine will corner with many cars more balleyhooed in that department and holds the road well at speeds hovering around 80 miles an hour. The car feels light on the road, but it inspires a confidence that it isn't going to walk sideways and doesn't. The same suspension that holds the car on the road like a cat also provides a ride that compares favorably with many cars in the heavier weight class.

Interiors are quite acceptable but the steering wheel interferes somewhat with a man's view of the road, interposes itself directly in front of a woman's eyes. The high hood line tends to give a somewhat diminished view of the road directly in front of the car as compared with many makes, but otherwise visibility is generally good.

However, the Ford is a car which gives the advantages of a light-weight automobile without sacrificing ride and roadability. With that OHV V-8 next year, you'll probably be "Watching the Fords Go By."

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,557
March	746,933	525,024
April		570,464
May		542,559
June		542,478
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Mar. 28	181,749	132,850
Apr. 4	170,567	125,668
Apr. 11	176,782	123,180
Apr. 18	162,171	131,657
Apr. 25	195,477	134,141
May 2	191,000*	128,385

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Let There Be Tail Light

You may have noticed some of the 5900 spanking new Mercuries roaming the pavements without the usual chrome bezel and tail lights. Seems that the Monroe suppliers' strike hit Mercury in the tail and to keep production rolling the cars were produced with cardboard and masking tape plugs.

The firm reports that the 5900 car tail light deficit is being made up at the rate of 400 a day and should be eradicated by this week.

Exhaust Notes

File this away for you'll be hearing plenty about it in the near future. Understood to be scheduled for announcement by General Motors next year is a turbine-powered experimental sports car, and Ford is also rumored to be readying a similar vehicle. One top auto designer in the Detroit area predicts that the turbine-powered sports car will be available in the next two or three years both here and from Europe, with turbines appearing on passenger cars here in the next five to ten years.

The gas turbine has been operated successfully in a European passenger car for over a year and is currently powering a truck successfully on the West Coast in this country. Power produced per pound of engine weight is phenomenal and body design problems fade into nothing since the ubiquitous turbine can be located anywhere a hole can be placed for its air intake. The unit requires no transmission except to reverse direction and gives the same effect as the automatics now in vogue.

The implications are of marked interest to metalworking men, for the turbine is proving itself wherever it is tested and foretells some marked changes in current auto design and manufacture. Firms now manufacturing jet engines could readily adapt their experience in machining alloys to the new turbine engines when the time comes. Your car of 1960 could well be powered by a Westinghouse or General Electric power plant.

The turbine is coming; the question is when.

On the Envelope Back

Shipments of Chrysler cars are 56 per cent ahead of the same period last year.

General Motors employment is at a record 544,806 persons.

The usual plethora of winners emerged from the Mobilgas Economy Run. One of the few definite losers was a Chevrolet entered by a West Coast dealer which miraculously missed a turn on the clearly marked course and . . . . ran out of gas.

Typical of the careful inspection which New Departure bearing parts must undergo, a raceway is checked by powerful microscope which could reveal the most minute flaw.

New Departure ball bearings are readily available at your equipment dealer or bearing distributor—supplied from the industry's largest nation-wide network of warehouse stocks.

ACCURATE TO THE ND DEGREE

Today's machines . . . automobiles or aircraft . . . conveyors or combines . . . recording instruments or radar installations . . . require accurate, low friction support for their moving parts. Where ball bearings are best for this job, the *best ball bearings* are New Departures, because of the highest quality standards in the industry.

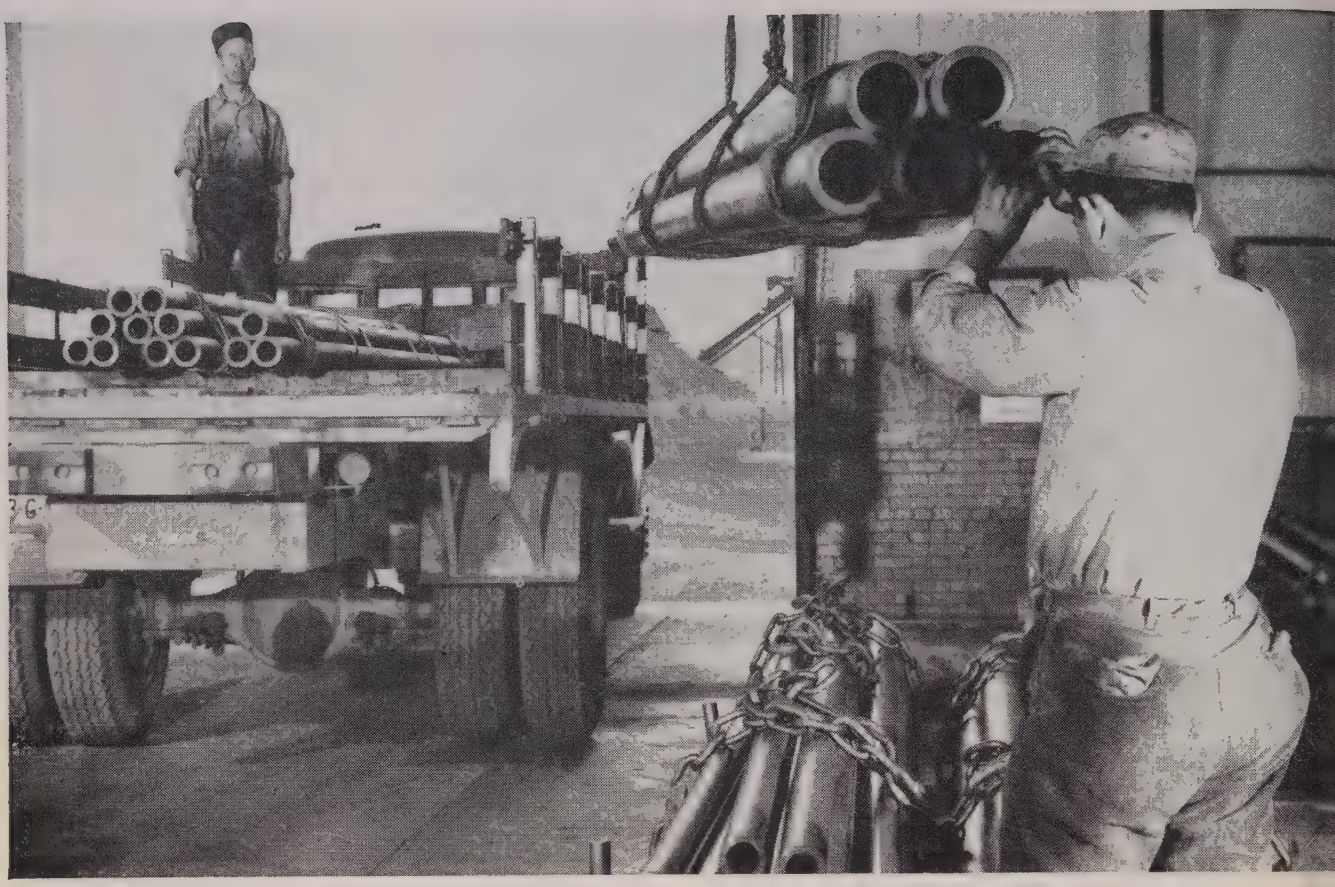
For many New Departure bearings the diameter and roundness of the balls are held within the limits of a few millionths of an inch. And other parts of the bearings . . . rings, races, separators and seals . . . must pass batteries of scientific inspection devices and skilled operators, before and after assembly.

If an application calls for ball bearings of pre-determined accuracy and life expectancy, install New Departures. Keep your eye on the BALL to be sure of your BEARINGS!

NOTHING ROLLS LIKE A BALL

NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Also Makers of the Famous New Departure Coaster Brake



52100 tubing shipped within 24 hours after you order!

GOT a rush hollow-parts job? The Timken Company will ship less-than-mill-quantities of 52100 tubing within 24 hours after receipt of your order.

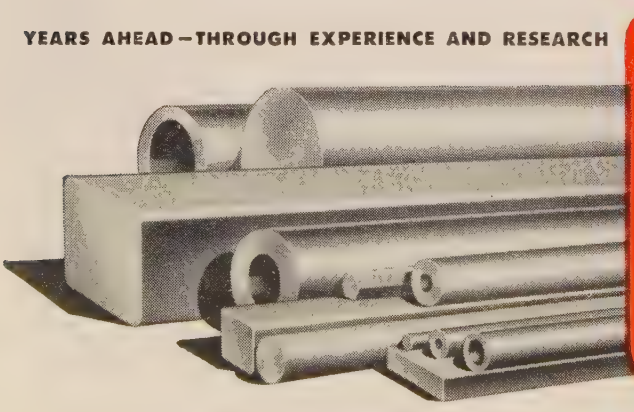
Timken® 52100 steel will do most of your hollow-parts jobs. It can be heat treated to file hardness and tempered back to any desired point. A high carbon steel, it is through-hardening in moderate sections, has high wear resistance and can often be used in place of more expensive steels. And it comes in sizes from 1″ to 10½″ O.D.

Here's a partial list of hollow-parts jobs for which Timken 52100 steel is used: aircraft parts, ball bearing races, pump parts and plungers, collets, bushing spindles, grinding machine parts and precision i struments.

The Timken Company's unmatched experienc as a pioneer producer of 52100 tubing, has result in uniform quality from tube to tube and order order. Rigid quality control checks every step production.

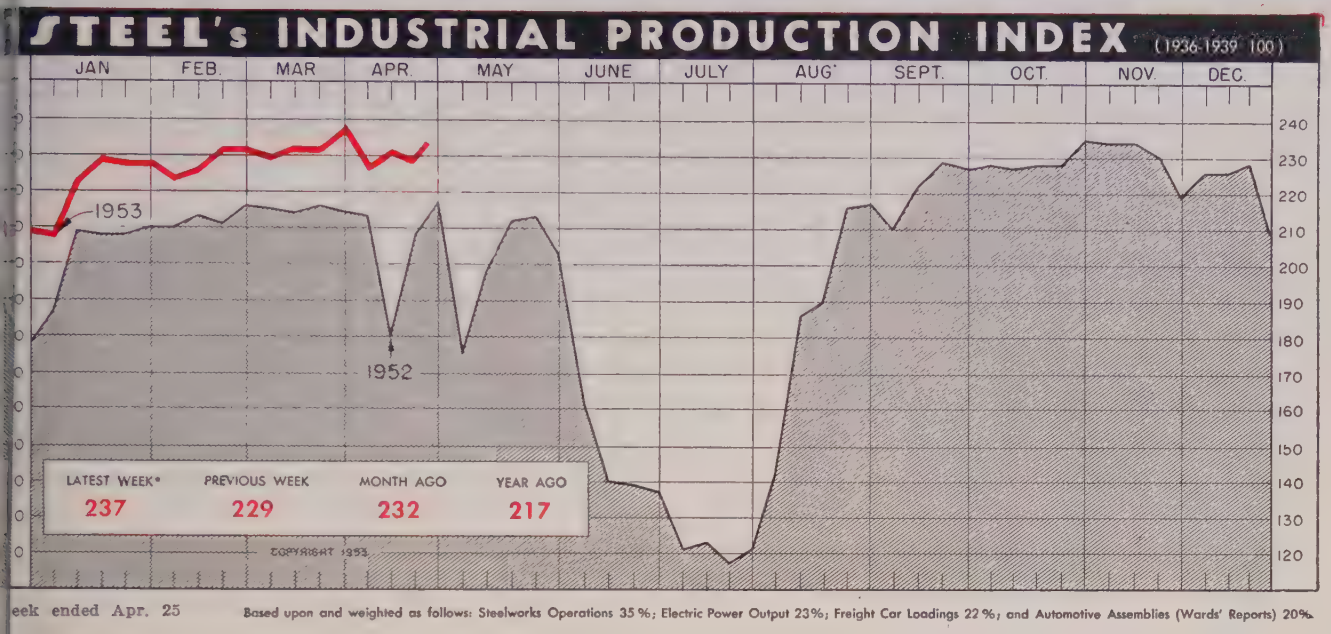
For immediate delivery of your less-than-mill-qua tity orders, write, wire or call The Timken Roll Bearing Company, Canton 6, Ohio. Cable addres "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBIN



eek ended Apr. 25

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Producers of civilian durables are expecting demand to remain high in the coming months. Civilian orders pour in for capital goods. Index jumps to a near-record level

PTIMISM is still the most rrent theme in metalworking recasts, despite the almost eady decline in defense orders. Behind the favorable outlook is e upsurge in consumer demand. anufacturers of passenger cars, V sets, kitchen and laundry apiances are selling more goods day than in any period since the ost-Korea boom, which collapsed ith a thud in the spring of 1951. ut most consumer goods indusies don't expect another such emand plunge in the coming onths. This is apparent in the surge in civilian orders for such asic capital goods as tools and es (p. 61), machine tools and undry equipment.

Tool Orders Climb—New orders aced in March for machine tools taled $95 million, the largest inux since July, says the National achine Tool Builders' Associaon. The association's new order dex rose in March to 323.5 per nt of the 1945-1947 average, or points over February and only fraction of 1 per cent under the lume a year earlier. Unfilled ders, nevertheless, continued to cline that month; tool builders Apr. 1 averaged about 8.6 months of work ahead at their demonstrated production rate, compared with 9 months on Mar. 1 and a 15.7-month backlog on Apr. 1, 1952.

Even more dramatic is the increase in orders for foundry equipment. New orders for foundry goods in March rose to $1.8 million, the highest total since January, 1952, according to a member-survey of the Foundry Equipment Manufacturers Association. The association's new order index rose 39.9 points to 396 per cent of the 1935-1939 average.

Index Nears Record—Industrial production across the U.S. is nearing another postwar record, as new orders arrive in droves. STEEL's production index jumped 8 points in the week ended Apr. 25 to 237 per cent of the 1936-1939 average. This 237-point index is only 1 point under the record set in the week ended Mar. 28.

Steel Production Heavy . . .

The steel industry is continuing to pour heavy tonnages as demand remains sturdy. The American Iron & Steel Institute says that production in the week ended Apr. 25 totaled 2,276,000 net tons of steel for ingots and castings, compared with the record 2,234,000 net tons produced in the week ended Mar. 28. Estimated for the week ended May 2: 2,262,000 net tons of steel.

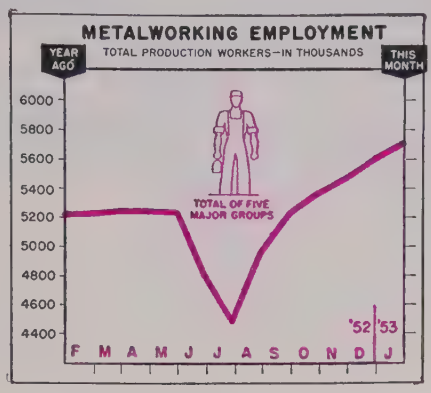
Auto Output Soars . . .

Automakers are pulling the throttle out on assembly lines. In early April, strikes and scattered materials shortages cut automotive output. Now, the industry is staging an all-out drive to regain this lost production. U.S. and Canadian plants in the week ended Apr. 28 raised weekly output to a 26-month high by completing 195,477 passenger cars and trucks, says *Ward's Automotive Reports*. Combined U.S.-Canadian output in the week ended May 2 is estimated by STEEL at 191,000 cars and trucks.

Cash Dividends Edge Up . . .

Manufacturers are paying out more in dividends this year than last, but the over-the-year increase is slight. Cash dividend payments in the first quarter by manufacturing corporations issuing public reports increased 1.5 per cent over the same months in 1952 to $1057 million, says the Commerce department's Office of Business Economics.

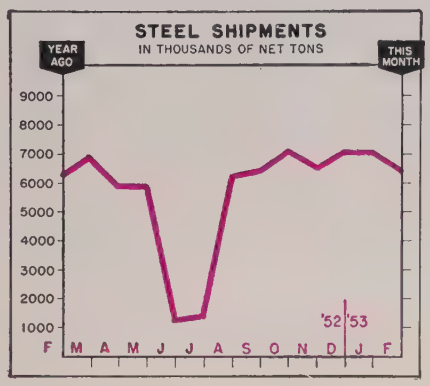
Iron and steel companies in the



Metalworking Employment
In Thousands
Production Workers—Five Major Groups

1952	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Feb.	1,160	805	1,280	726	1,243
Mar.	1,154	807	1,280	722	1,266
Apr.	1,143	806	1,282	714	1,288
May	1,141	798	1,269	708	1,307
June	716	769	1,261	706	1,323
July	676	726	1,203	685	1,169
Aug.	1,110	783	1,181	708	1,192
Sept.	1,153	821	1,193	743	1,330
Oct.	1,162	847	1,212	766	1,380
Nov.	1,173	863	1,242	784	1,421
Dec.	1,183	881	1,283	800	1,460
1953					
Jan.	1,188	891	1,289	804	1,484
Feb.	1,192	904	1,297	820	1,501

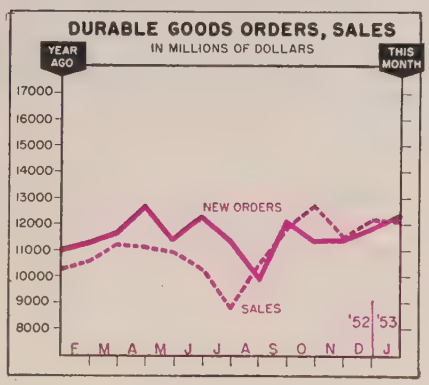
U. S. Bureau of Labor Statistics.



Steel Shipments
Net Tons

	1953	1952	1951
Jan.	7,068,438	6,589,193	6,904,688
Feb.	6,533,227	6,358,293	5,776,229
Mar.	.....	6,890,391	7,105,078
Apr.	.....	5,922,173	6,634,510
May	.....	5,947,450	6,938,708
June	.....	1,250,243	6,645,897
July	.....	1,413,672	5,988,574
Aug.	.....	6,312,118	6,755,589
Sept.	.....	6,542,147	6,207,491
Oct.	.....	7,155,611	6,844,093
Nov.	.....	6,647,725	6,509,048
Dec.	.....	7,105,382	6,411,105

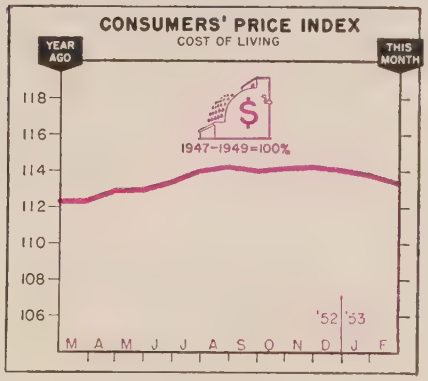
American Iron & Steel Institute



Durable Goods Orders, Sales
In Millions of Dollars

	New Orders*		Sales	
	1953	1952	1953	1952
Jan.	12,080	11,142	11,747	10,459
Feb.	12,619	11,392	12,206	10,604
Mar.	.....	11,841	.....	11,270
Apr.	.....	12,761	.....	11,237
May	.....	11,492	.....	11,056
June	.....	12,423	.....	10,284
July	.....	11,393	.....	8,844
Aug.	.....	9,938	.....	10,579
Sept.	.....	12,198	.....	11,905
Oct.	.....	11,452	.....	12,787
Nov.	.....	11,441	.....	11,510
Dec.	.....	11,930	.....	12,172

* Seasonally adjusted. U. S. Office of Business Economics



Consumer Price Index
(1947-1949=100)

	1953	1952	1951
Jan.	113.9	113.1	108.6
Feb.	113.4	112.4	109.9
Mar.	113.6	112.4	110.3
Apr.	....	112.9	110.4
May	....	113.0	110.9
June	....	113.4	110.8
July	....	114.1	110.9
Aug.	....	114.3	110.9
Sept.	....	114.1	111.6
Oct.	....	114.2	112.1
Nov.	....	114.3	112.8
Dec.	....	114.1	113.1

U. S. Bureau of Labor Statistics

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Apr. 6	Indus. Production .Apr. 27	Ranges, Gas .....Mar. 30
Employ., Steel ....Apr. 6	Ironers .....Apr. 13	Refrigerators .....Feb. 2
Fab. Struc. Steel..Mar. 30	Machine Tools ....Apr. 27	Steel Castings ....Apr. 20
Foundry Equip. ...Apr. 27	Malleable Castings.Apr. 20	Steel Forgings ....Apr. 20
Freight Cars .....Mar. 23	Pumps .....Apr. 6	Vacuum Cleaners..Mar. 23
Furnaces, Indus. ..Apr. 6	Prices, Wholesale..Apr. 13	Wages, Metalwk. ..Apr. 27
Gear Sales .....Mar. 9	Radio, TV .....Apr. 13	Washers .....Mar. 30
Gray Iron Castings.Apr. 20	Ranges, Elec. .....Apr. 13	Water Heaters ....Mar. 30

first three months in 1953 pai $101.6 million, compared wit $100.9 million in the same perio in 1952. Producers of nonferrou metals paid $38.9 million, com pared with $38.2 million, a yea earlier. The nonelectrical machin ery industry increased dividend to $82.1 million from $79 millio while electrical machinery make raised payments to $56.8 millio from $54.7 million. The transpor tation equipment industry (othe than automotive) increased pay ments to $19.4 million from $18. million, and automotive companie in the first quarter paid stock holders $133.8 million, compare with $132.3 million in the January March period of 1952.

In nonmanufacturing, all indus tries increased payments, excep mining corporations. Nonmanu facturers' dividends rose 5 pe cent over a year earlier to $198 million, while the mining industr lowered payments to $94.8 millio from $96.6 million in the first qua ter of 1952.

Range Sales Jump . . .

Manufacturers of gas ranges ar discovering an ever increasin demand for their products. Ga Appliance Manufacturers Associa tion Inc. says that industry shi ments of domestic gas ranges ros 11.5 per cent over a year earlie to 577,100 units in the first qua ter. March shipments totaled 185 200 units, or 24 per cent ove March, 1952, the peak month o last year's first quarter.

Demand for automatic ga water heaters is following a lik pattern but with an even large scale in over-the-year increase Shipments of gas water heaters i the first quarter rose 29.8 per cen over the same 1952 months to 581 300 units. Shipments in Marc amounted to 206,400 units, o 34.6 per cent over March, a yea earlier, also the best month i the first quarter, 1952.

Laundry Equipment Up . . .

Demand may be strong in th kitchen, but it is really thumpin in the cellar. Makers of laund equipment, whose market is le saturated than that of kitche appliance makers, are boostin

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	98.0	97.5	102.5
Electric Power Distributed (million kwhr)	8,016	8,112	7,135
Bituminous Coal Output (daily av.—1000 tons)	1,450	1,404	1,533
Petroleum Production (daily av.—1000 bbl)	6,240[1]	6,280	6,371
Construction Volume (ENR—millions)	$288.0	$275.0	$371.1
Automobile, Truck Output (Ward's—units)	195,447	162,171	134,141
TRADE			
Freight Car Loadings (unit—1000 cars)	740[1]	751	779
Business Failures (Dun & Bradstreet, number)	159	165	168
Currency in Circulation (millions)[3]	$29,722	$29,753	$28,333
Dept. Store Sales (changes from year ago)[3]	+8%	+13%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,417	$17,667	$17,672
Federal Gross Debt (billions)	$264.3	$264.4	$258.0
Bond Volume, NYSE (millions)	$20.4	$14.8	$17.0
Stocks Sales, NYSE (thousands of shares)	7,863	7,093	6,800
Loans and Investments (billions)[4]	$76.9	$76.9	$73.1
United States Gov't. Obligations Held (billions)[4]	$29.6	$29.7	$31.2
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	222.7	226.0	243.6
All Commodities[7]	109.7	109.5	112.3
All Commodities Other Than Farm and Foods[7]	113.2	113.3	113.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

roduction far above last year's evels.

The American Home Laundry Manufacturers' Association says hat factory shipments of stand-rd-size household washers in the irst quarter were 32.2 per cent greater than a year earlier by otaling 949,902 units. Automatic umbler dryers aggregated 168,989 nits, 29.3 per cent over the first three months of 1952. Factory ales of ironers amounted to 63,-049 units, up 33.7 per cent from the first quarter, 1952.

Living Costs Dip . . .

If you hoped that the cost-of-living on Mar. 15 would mark a decline for the fourth consecutive month, you found your hopes go-ng up in cigarette smoke. The Bureau of Labor Statistic's new consumers' price index between mid-February and mid-March re-versed a 3-month downtrend by rising 0.2 per cent to 113.6 per cent of the 1947-1949 average. Largely responsible for the in-crease was the boost in cigarette prices on Feb. 25.

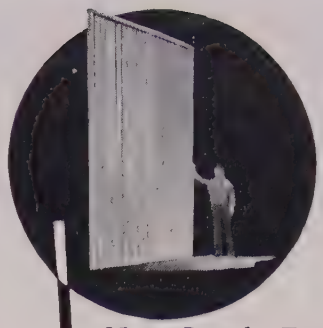
Business Momentum Steady . . .

Business momentum in April, normally a pickup month, re-mained near the March velocity, although slight gains were made in new orders and production. That's the consensus of industrial buyers surveyed by the National Association of Purchasing Agents. Employment in April remained high, but overtime was reduced. Both skilled production and trained office workers were hard to find. A number of work stop-pages occurred last month but were of short duration.

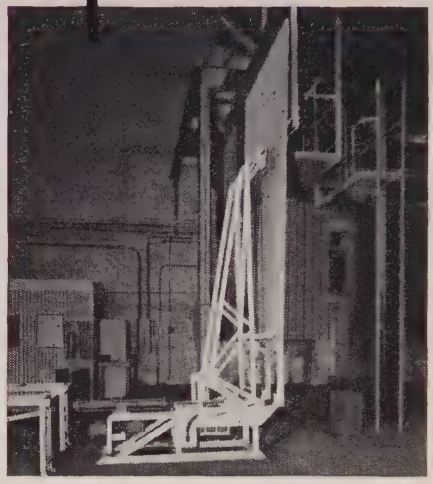
Unworked material inventories dipped in April, following a level-ing off in the previous month. This is a normal condition as spring and summer production schedules get into full swing, says the as-sociation. Reports of defense order cancellations, cutbacks and stretchouts, had little effect on raw materials supplies.

Trends Fore and Aft . . .

Corporate net working capital increased 4 per cent to $86.5 bil-lion in 1952, about the same in-crease as in 1951. Current assets rose $9 billion, as liabilities rose $5 billion . . . Orders for indus-trial furnaces (other than for hot-rolled steel) totaled $16.5 million in the first quarter, compared with $14.7 million in the same period of 1952 . . . Individuals sank $10 billion deeper into debt last year for homes and consumer goods.



You Don't Toss These 500 Pound Doors Around One-Handed



Ingenious Fully Automatic Material Handling System Moves Bulky Steel Doors Safely and Efficiently Through a Production Cycle.

Each door, held in a frame by magnets, is raised from a horizontal to a vertical position then set on to an overhead conveyor and released to travel through various production processes. Finally it is removed from the conveyor and returned to the original, horizontal position—a finished product.

Every phase of the handling cycle is automatic and synchronized with every other movement.

The Door Handling Installation may not fit your material handling problems but whatever their nature the Allied Engineering Staff can provide solutions; consult us.

Allied Manufacturers Various Types of Conveyors

Floor Conveyor

Overhead Conveyor

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STEEL AND CONVEYORS, INC.

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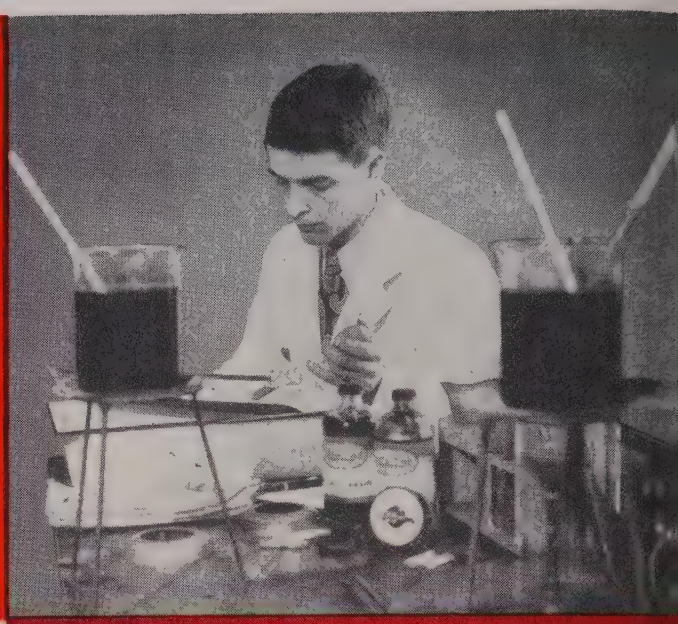
ENTHONE ENAMEL STRIPPERS



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to fill your particular needs . . .

If you have trouble finding the right stripper to remove the coating on your work, Enthone will be glad to select the right one from the many they make or will formulate a new one that will meet your requirements.

All you have to do is fill out a questionnaire which will be sent you on request, send this to us with typical samples of your work. Enthone Research Chemists will make the necessary tests and tell you how your problems can be solved. There is no charge for this service.

Enthone Research Chemists have developed over a score of strippers for organic finishes and are constantly seeking better methods.

Write for Enthone check list on over sixty products and processes for better electroplating and metal finishing.

METAL FINISHING PROCESSES

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442 ELM STREET
NEW HAVEN, CONNECTICUT

ELECTROPLATING CHEMICALS

JOHN K. BEIDLER

LOUIS P. STRUBLE JR.

. . . new vice presidents of Dravo Corp.

ewly elected vice presidents of ravo Corp., Pittsburgh, are **John . Beidler**, general manager of the achinery division, and **Louis P. truble Jr.**, general manager of the eystone Division. **Clifford A. Hill** as elected treasurer and **Edward . Fitch** controller.

uido P. Palma was elected presi-ent and treasurer, **Bearium Metals orp.**, Rochester, N. Y., succeeding he late **E. Phelps Langworthy.** Ir. Palma continues as president f the Canadian affiliate, Bearium Ietals of Canada Ltd.

Hendrik B. Van Rensselaer was lected vice president in charge of roduction of **Lock Joint Pipe Co.**, ast Orange, N. J.

leveland-Cliffs Iron Co., Cleveland, lected **Edward B. Greene** honorary hairman. **Alexander C. Brown**, resident and chief executive, was ade chairman and president.

ohn W. Putnam was appointed hief metallurgist, **Engineered Pre-ision Casting Co.**, Matawan, N. J.

Villiam H. Meyer and **Vincent Bur-er** have joined **Green River Steel orp.**, Owensboro, Ky., as, respec-ively, metallurgical sales engineer nd sales representative.

elta Power Tool Division, Rock-ell Mfg. Co., Pittsburgh, appoint-ed four product managers as follows: **Ben Eldridge**, metalworking division; **T. C. Mortimer**, woodworking division; **I. G. Meyer**, Homecraft tools division; and **A. B. Taylor**, accessories division.

Chrysler Corp. appointed **Raymond E. Hewlett** general manager of its Michoud Ordnance plant in New Orleans to succeed **R. S. Bright**, named general manager of Chrysler's Indianapolis plant. Mr. Hewlett has been master mechanic at the Michoud plant since it was assigned to Chrysler by Ordnance in 1951 for manufacture of 12-cylinder Continental tank engines for the Patton tank.

Arnold E. Jakel was appointed general manager, **Supreme Metal Treating Co.**, Milwaukee. He was formerly assistant chief inspector of Heil Co.

James Gerity Jr., president, Gerity-Michigan Corp., was elected a director of **Schultz Die Casting Co.**, Toledo, O.

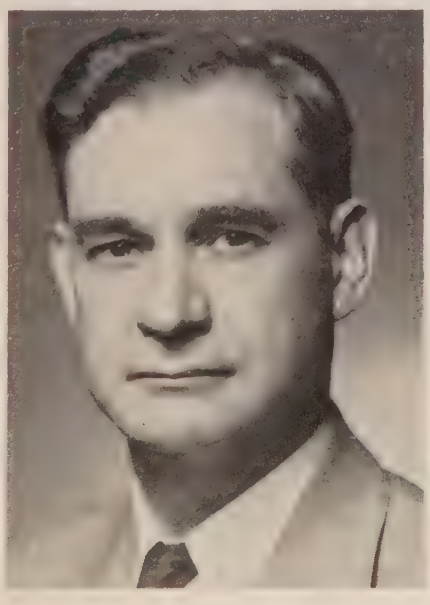
John W. McCaughan was made manager, box and fittings sales department, **National Electric Products Corp.**, Pittsburgh.

Howard D. Neal, general manager, **Aerol Co. Inc.**, Los Angeles, was promoted to vice president and general manager.

Jack & Heintz Inc., Cleveland, appointed **Joseph E. Mulheim** chief engineer. He has been assistant manager, aviation engineering, at the Lima, O., plant of Westinghouse Electric Corp.

R. W. Allen was elected vice president, **Mack Motor Truck Corp.**, New York, and made manager of its central division, with headquarters in Chicago.

Edward O. Hascall was appointed



RAYMOND E. HEWLETT

R. S. BRIGHT

. . . Chrysler Corp. appointments

JUDSON C. TRAVIS
. . . Handy & Harmon president

RUSSELL M. FRINK
. . . Wolverine Tube operations director

A. E. REINHARD
. . . promoted at Great Lakes Steel

director of purchasing, **Ainsworth Mfg. Corp.**, Detroit. He succeeds **C. L. Miller**, retired, but who remains on the executive staff as consultant.

Judson C. Travis was elected president, **Handy & Harman**, New York. He assumed his new duties May 1 after 35 years of service with the company. During the past year he served as vice president-general manager, and prior to that had been executive vice president since 1950. He succeeds **G. H. Niemeyer** who continues as a director, chairman of the executive committee and president of Handy & Harman of Canada Ltd., a subsidiary.

General Gas Corp. appointed **Ray L. Farabee** a vice president of its subsidiary, Delta Tank Mfg. Co. Inc., Baton Rouge, La. He is in charge of production, engineering, research and development.

Fred G. Krach was appointed to the new position of purchasing agent in charge of raw materials at **Servel Inc.**, Evansville, Ind.

Russell M. Frink, Detroit plant manager, **Wolverine Tube Division**, Calumet & Hecla Inc., was named director of operations in charge of co-ordinating activities of the Detroit and the Decatur, Ala., plants of the division. He replaces **D. W. Blend**, recently appointed general manager of Wolverine. **Vincent A. Zatell** was made Detroit plant manager and **A. S. Kromer**, manager of the Decatur plant.

Edson Moshier was appointed general works manager, **L. C. Smith & Corona Typewriters Inc.**, Syracuse, N. Y. **William A. Gabrielson** succeeds Mr. Moshier as works manager.

A. E. Reinhard, production superintendent, was made assistant vice president in charge of all steelmaking operations at **Great Lakes Steel Corp.**, Ecorse, Mich. **T. C. Mayberry** was promoted from general superintendent to general works manager. **J. J. Jeffrey**, vice president-personnel, was in addition assigned operation department responsibilities as assistant to **J. E. Fink**, vice president in charge of operations.

New regional sales managers for **Sterling Electric Motors Inc.** are **John R. Howell** for the western part of the United States operating from Los Angeles, and **Robert T. Dudley** for the eastern areas, with office in Chicago. **K. J. Plants** was made New York district manager.

Frank Passal was promoted to assistant director of research, plating division, **United Chromium Inc.**, New York.

H. H. Powers was elected president, **Technical Oil Tool Corp. Ltd.**, Hollywood, Calif., to succeed **J. B. Wood**, new chairman of the board. **E. G. McConnell** was elected vice president in charge of mid-continent sales.

Harvill Corp., Los Angeles, elected **Richard B. Clevering** president to succeed **E. F. Gould**, who remains a member of the board.

Elbert K. Pollard was appointed assistant plant manager, Buffalo assembly plant of **Ford Motor Co.**

D. H. Burrell III was elected vice president-operations, **Cherry-Burrell Corp.**, Chicago, succeeding **Carl A. Wood**, retiring from active duties.

Arthur C. Dorst was named foreman of the finished goods warehouse at the Milwaukee plant of **Inland Steel Products Co.** **Harry Nowak** was made foreman, steel warehouse.

Robert E. Parkinson was appointed supervisor of materials research for **Kawneer Co.**, Niles, Mich.

E. T. Lippert Saw Co., Millvale, Pa., appointed **C. E. Pfischner** president, **Fred L. Pfischner** vice president, **Robert D. Pfischner** secretary, **F. J. Pfischner**, treasurer.

National Electric Products Corp., Pittsburgh, named **Frank D. King** to manage a new section of its industrial sales department which will handle the new Nepco header duct wiring system.

George P. Page is now southern sales manager for **Taylor-Wharton Iron & Steel Co.** with headquarters in Birmingham.

At **Rosan Inc.**, Newport Beach, Calif., **Jerry Hester** was made head of administrative engineering,

Windpipe for a peaceful H-bomb

You can call it an H-bomb if you like. Some people do. Technically, it *is* a hydrogenation bomb or, simply, a super-pressure vessel. Uses for it are legion but not warlike.

Researchers in rubber, plastics, pharmaceuticals, petroleum, and solvents pilot their hydrogenation, oxo-reaction, polymerization and other jaw-breaker problems in its gizzard—under high pressure.

To speed-up chemical reactions, the vessel is rocked 38 times a minute. Pressurizing a see-sawing chamber is in itself a neat trick: when pressures of the order of 60,000 p.s.i. are required you might become discouraged or concerned.

American Instrument Company, Inc., maker of Super-pressure equipment, introduces the pressure through a spiral windpipe. They had some trouble through tube breakage but that was before they tried Superior 304 Cold-drawn Seamless Stainless Steel Tubing. Superior gives them just the flexibility and fatigue strength needed for cyclic operation, plus chemical resistance and burst pressure to spare. Spirals of Superior 304 are easier to bend, last longer. And American Instrument reports them dimensionally uniform, smooth and free from surface imperfections.

If you haven't found small tubing in the analysis, size, and finish you want, or if you think there's little difference in tubing or tubing experience, Superior invites your inquiry. Superior Tube Company, 2002 Germantown Avenue, Norristown, Pennsylvania.

nd and Shaped Tubing available in Carbon, Alloy, and Stainless Steels; Nickel and Nickel Alloys; Titanium, Zirconium, and Beryllium Copper

Superior

THE BIG NAME IN SMALL TUBING

West Coast: Pacific Tube Company, 5710 Smithway St.,
Los Angeles 22, Calif. UNderhill 0-1331

All analyses .010″ to ⅝″ O.D.
Certain analyses (.035″ max. wall) up to 1⅜″ O.D.

PATRICK J. URSO
. . . Allied Metals fabricating div. mgr.

CHARLES A. SIMMONS JR.
. . . new president of Simmons Machine Tool

WILLIAM M. BAUSCH
. . . new position at Follansbee Steel

Glenn Aron, engineering field representative, and **Richard Gifford** chief test engineer.

Patrick J. Urso was appointed manager, fabricating division, **Allied Metals Co.,** Niles, O. Prior to joining Allied in 1951 he was sales manager, reinforcing bar and steel products divisions of West Virginia Steel & Mfg. Co. **Morris Friedman,** operations manager, was promoted to assistant general manager.

Clarence B. Jones was made secretary and general attorney, **Diversey Corp.,** Chicago. **O. E. Soderberg** was made treasurer, a position made vacant in November by the death of **C. E. Glasser.**

New directors added to the board of **American Machine & Foundry Co.,** New York, are **Rodney C. Gott,** vice president AMF, and **Murray McConnel,** president and director, Cuno Engineering Corp.

F. M. Galloway was elected vice president-research and development, **Quaker Rubber Corp.,** division of H. K. Porter Co. Inc., Philadelphia.

Frank W. Nitterhouse Jr. was named superintendent, masonry department, Middletown, O., division of **Armco Steel Corp.**

Reynolds Metals Co., Louisville, appointed **John Staley** project director in its product and market sales development department, and **Richard E. Dysart** as assistant manager, industrial advertising.

Charles A. Simmons Sr., who founded **Simmons Machine Tool Corp.** of Albany, N. Y., in 1910 and has been its president since, was elected chairman of the board. His son, **Charles A. Simmons Jr.,** becomes president, moving up from vice president-general manager.

Vincent J. Doyle will represent **Lebanon Steel Foundry** at its new Canadian branch opened at 304 Crescent Bldg., Montreal. He was formerly with Sorel Industries Ltd.

Clark A. Ralph was appointed director of purchases, **Wales-Strippit Corp.,** North Tonawanda, N. Y. He continues as plant manager.

Henry T. Bodman replaces the late **Walter S. McLucas** on the board of **Detroit Steel Products Co.,** Detroit.

J. M. Friedlander was elected a director of **Signode Steel Strapping Co.,** Chicago.

Wray Kephart was made division purchasing agent for **Gar Wood Industries Inc.,** Wayne Division, Wayne, Mich., where **D. J. Byrd** becomes division assistant sales manager.

A. A. Shantz was appointed assistant general sales manager-trucks for the **GMC Truck & Coach Division,** General Motors Corp., Pontiac, Mich.

Frederick Fleischman Jr. was named manager of advertising and sales promotion for **Willys-Overland Export Corp.,** Toledo, O.

William M. Bausch was appointe assistant vice president-mill sale at **Follansbee Steel Corp.,** Pitts burgh. He was sales manager, mi products.

Ahmed N. Sharif was made produc tion control supervisor of **Electri Regulator Corp.,** Norwalk, Conn.

Eugene P. Reed was made assis ant manager of raw materials a U. S. Steel Corp.'s **Tennessee Co & Iron Division,** Birmingham.

Cyril S. Kimball was promote from vice president to executiv vice president, **Foster D. Snell Inc** New York.

S. B. Casey was elected to th board of **Elastic Stop Nut Corp. America,** Union, N. J., to replac his brother, the late **John F. Case**

D. T. Fisher was made controlle and **G. T. Bovee** treasurer of **Co solidated Vultee Aircraft Corp** San Diego, Calif.

Chance Vought Aircraft Divisio United Aircraft Corp., Dallas, a pointed **Dr. W. R. Hedeman** proje engineer and **O. K. Bell** assista project engineer in its missile d sign section.

Alloy Precision Castings Co., Clev land, appointed **M. R. Bates** sal engineer. He has been employe in various design and metallurg capacities at Reliance Steel Co. a Monarch Aluminum Co.

Dearborn Chemical Co., Chicag

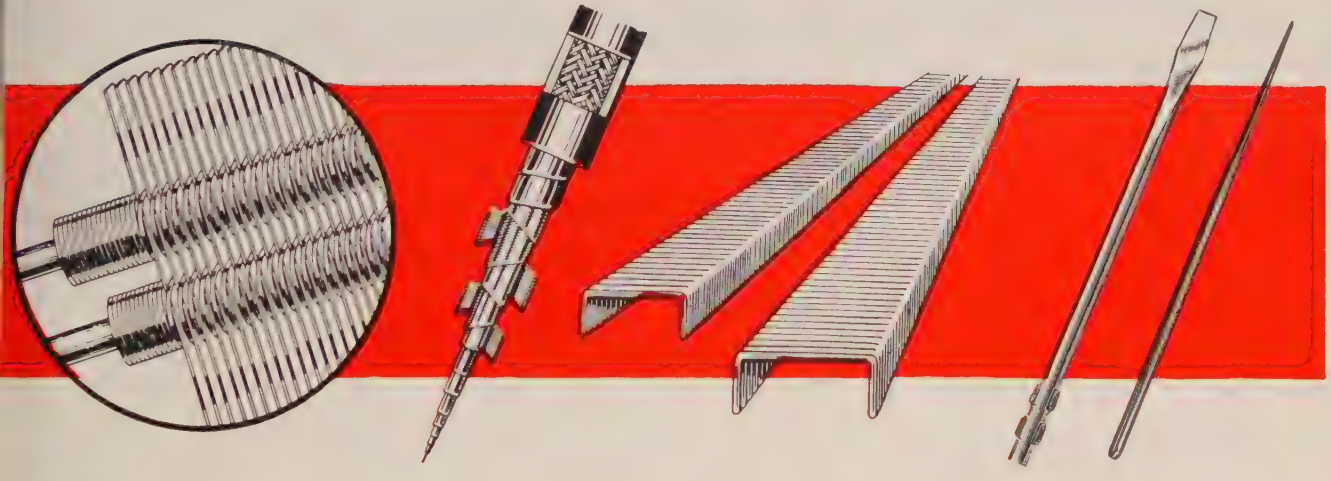
Specialty wires are a specialty

with WICKWIRE

Wickwire specialty steel wires such as flexible shaft wire, spheroidized wire, dent spacer wire, aircraft cord wire, bobbin ring wire, broom and brush wire, weaving wire, rope wire and preformed staple wire have long been proud products of Wickwire.

Our fully integrated facilities enable us to produce wire that is always uniform in temper, tensile and finish . . . wire that's easily workable and will stand up under the most severe forming operations.

We can meet your most exacting specifications for specialty wire that best suits your particular requirements . . . in high or low carbon steel; round or shaped; and in a wide variety of tempers, grades and finishes. For The Wire You Require—Check First With Wickwire.

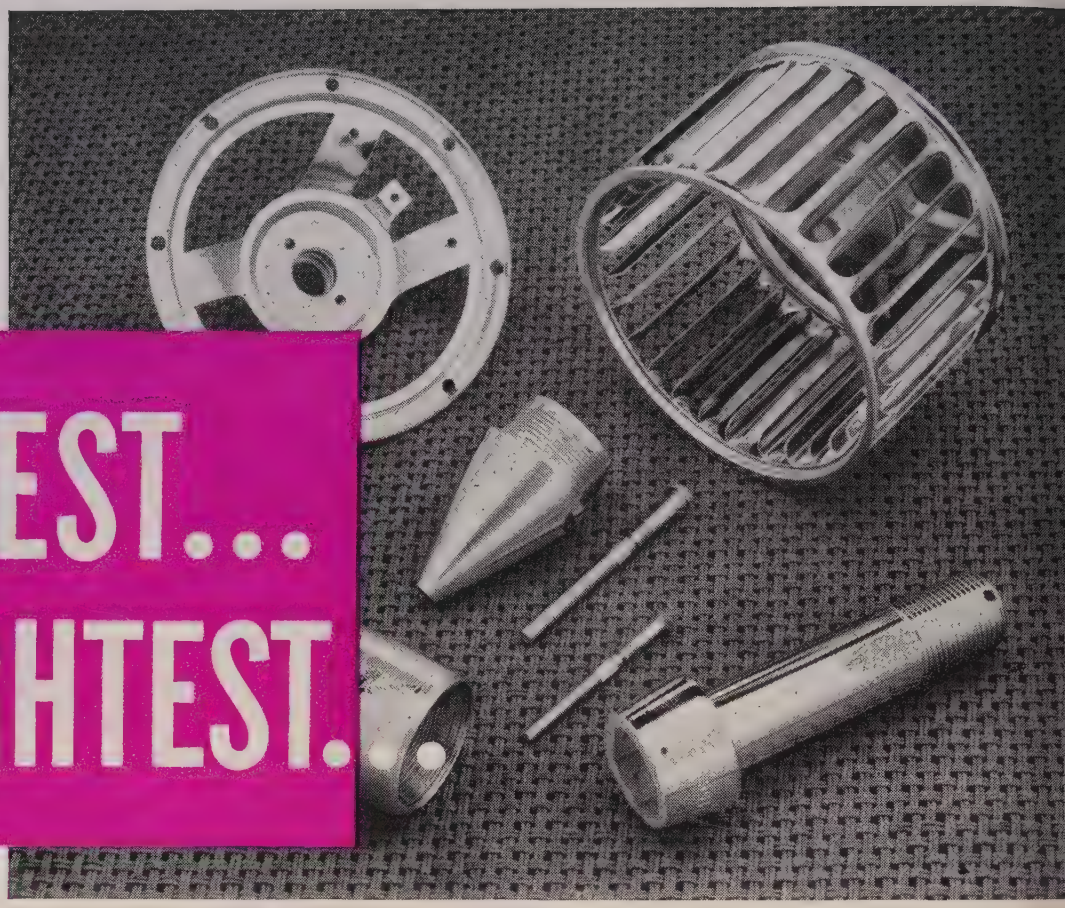


THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia

WICKWIRE WIRE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I



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UDYLITE BRY-CAD

THE NEW BRIGHT CADMIUM PROCESS!

New Udylite Bry-Cad is unequalled in brightness, throwing power, plating speed and covering!

But that's not all! Bry-Cad offers exceptional operating economy, too. It is highly resistant to both organic and metallic impurities. New Udylite Bry-Cad provides high cathode efficiency and operates over a wide current density range with little "gassing" and no spray. This materially reduces waste.

Complicated parts . . . deep recessed . . . intricate shapes . . . are all plated uniformly with new Bry-Cad. And only one liquid brightener is needed for the whole operation.

Have your Udylite Technical Man give you the complete story or write direct. THE UDYLITE CORPORATION, DETROIT 11, MICHIGAN. *West of Rockies, L. H. Butcher Co., Los Angeles 23, California.*

PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

ERNEST H. BELLARD
. . . Swartwout gen. sales mgr.

J. T. RYAN JR.
. . . heads Mine Safety Appliances Co.

W. A. MATTIE
. . . gen. mgr. Eaton's heater div.

ppointed **H. E. Johnston** manager its New York office.

rnest H. Bellard, sales manager r ventilation division, **Swartwout** o., Cleveland, was appointed gen- al sales manager, a newly created sition. Other appointments in- ude **M. M. Ward,** sales manager, ower plant division; **Robert J. nes,** sales manager, process divi- on; **Jay P. Johnson,** sales man- ger, ventilation division; and **obert K. Dick,** advertising man- ger in charge of promotion activi- es of all three divisions. Also, to ssist in general management, **Ken- on Swartwout** was made executive ice president. He has been chief ngineer of the power plant divi- ion five years.

ppleton Electric Co. appointed **ohn O. Bell Jr.** district sales man- ger for Texas with headquarters n Houston.

J. T. Ryan Jr. is the newly elected president of **Mine Safety Appliances Co.,** Pittsburgh. He succeeds **George H. Deike Sr.,** named chairman of the board. Since 1948 Mr. Ryan has been executive vice president. He also is president of Callery Chemical Co., a subsidiary.

Newly elected assistant vice presidents at **Bell Aircraft Corp.,** Buffalo, are: **John F. Strickler Jr.,** executive chief engineer; **Herbert H. Munsey,** patent counsel and director of foreign contracts; **G. B. Clark,** director of helicopter contracts; and **John W. Rane Jr.,** director of contracts administration.

Appointments in the welding division, **P. R. Mallory & Co. Inc.,** Indianapolis, include **Phil Watson,** division manager; **Dave Smith,** head of the sales department. **Bill Fetter,** former welding division manager, was named to manage the switch division.

W. A. Mattie was made general manager, heater division, **Eaton Mfg. Co.,** Cleveland. He succeeds the late **C. C. Bradford.** In addition **R. F. Gamundi** succeeds Mr. Mattie as superintendent.

Franklin P. Hinman was advanced to product manager of the headquarters plant, electronic tube division, Elmira, N. Y., **Westinghouse Electric Corp.**

Tenney Engineering Inc., Newark, N. J., promoted **Fred Hermann** to refrigeration application engineer, environmental test chamber division.

Dr. E. E. Lyder and **Dr. Nathan Shlechter** joined **Bechtel Corp.'s** industrial division at Los Angeles.

Charles B. Tillson Jr. was made superintendent, **Crucible Steel Co. of America's** coal mine located at Crucible, Pa. He replaces **T. P. Latta,** retired.

OBITUARIES...

David J. Bonawit, 60, chief engineer, **Marshall-Eclipse Division,** Bendix Aviation Corp., Green Island, N. Y., died Apr. 22.

Robert M. Schrader, 55, since 1945 general manager of purchases at **Continental Can Co.,** New York, died Apr. 24.

Clarence E. Abbott, former vice president, **Tennessee Coal & Iron Division,** U. S. Steel Corp., died Apr. 14 in Raleigh, N. C.

Martin W. Keller, 68, vice president in charge of manufacturing and works manager of the Sherill, N. Y., plant of **Oneida Ltd.,** died Apr. 20.

Oscar C. Schmitt, 58, president and director, **Emerson Electric Mfg. Co.,** St. Louis, died Apr. 21.

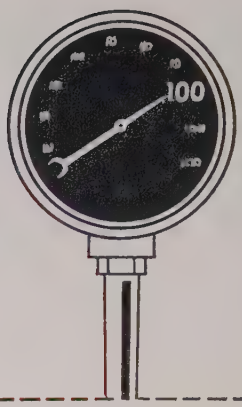
Ralph L. Swank, 70, vice president, **Hiram Swank's Sons,** Johnstown, Pa., died Apr. 14.

William A. Seiler, 61, purchasing agent for raw materials and containers of **Calco Chemical Division,** American Cyanamid Co., Bound Brook, N. J., died Apr. 22.

James R. Thompson, 66, who retired in 1951 as manager, metallurgical department, **American Steel & Wire Division,** U. S. Steel Corp., Cleveland, died Apr. 25. Since retirement he had been a consultant to Lamson & Sessions Co.

Harry M. Carroll, 60, advertising manager, **Hyatt Bearings Division,** General Motors Corp., Harrison, N. J., died Apr. 20.

keeping air pressure UP THOUSANDS of feet DOWN



At the Silver Summit Mine in Osburn, Idaho, in a vaulted room more than 1,000 feet below the surface, an Ingersoll-Rand PRE compressor (shown below) converts electric power into air power used to help tear silver, copper and lead ores from the earth.

This spic and span installation, shown below, is reached through a tunnel 6,000 feet long. The 400-hp compressor provides air for mine workings as far as 3,400 feet below it.

Placing the compressor underground has two advantages: First, it eliminates costly piping that otherwise would be necessary to transmit compressed air more than a mile from a surface plant to the working shaft. Second, it avoids air pressure losses that would be caused by leakage and the friction of air passing through a mile-long pipe.

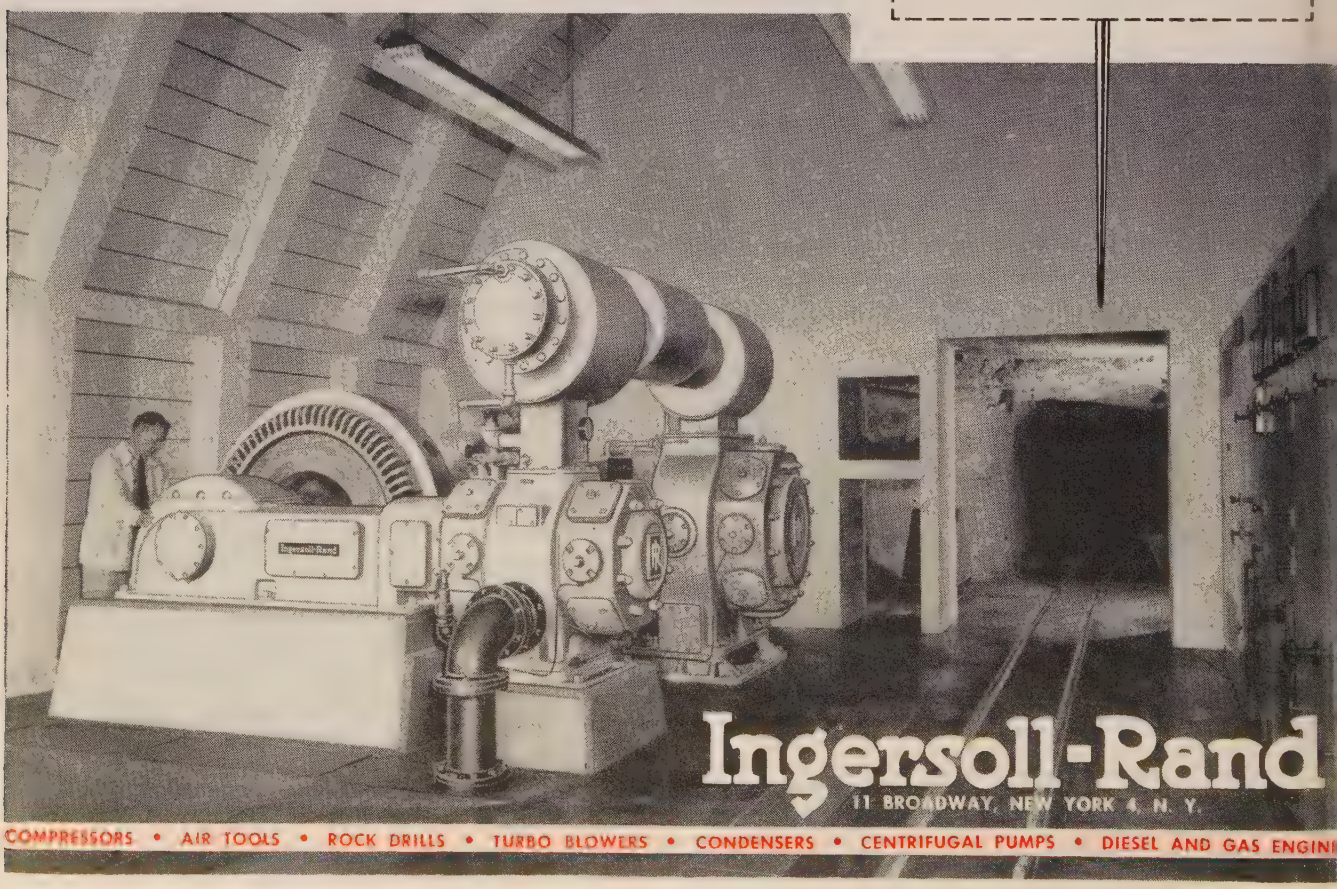
This is not the first underground PRE installation for the Hecla Mining Company whose management controls the operation of Silver Summit Mining Co. It had previously relocated one unit at its Star Mine from the surface plant to an underground station where it also installed a new PRE. This step eliminated the surface plant and the pressure losses formerly caused by 11,000 feet of air piping. Several other I-R compressors have been serving Hecla's older properties for more than 30 years.

Long recognized as a leader in using modern mining equipment to increase production, Hecla mines employ many Jackhamers, drifters, Jackbits, hoists, pumps, and other I-R products.

861-1

FEATURES OF THE "PRE" COMPRESSOR

- Crankcase need not be opened for bearing adjustments . . . stays clean.
- Main bearings have micrometer adjustment from outside of crankcase.
- Full-floating crankpin and crosshead-pin bearings result in long bearing life.
- Unique, built-in, force-feed running gear lubrication eliminates piping both inside and outside compressor.
- I-R stainless-steel Channel Valves are efficient and durable.
- Automatic 5-step full Clearance Control regulates compressor output.
- Built for continuous full-load operation . . . for air or any gas . . . for any pressure . . . sizes from 300 to 3000 hp.



Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINE

nputers for Aircraft

ouglas will install IBM ma- ines to predict aircraft and issile performances

NSTER computers, capable of ving mathematical problems in minutes that would require one n with a desk calculator eight rs to do, will be installed by uglas Aircraft Co. Inc. in its ta Monica and El Segundo, if., plants.

Known as "electronic data proc- ng machines," the giant 11-ton tronic calculators were devel- d by International Business Ma- nes Inc. and rented by Douglas. e computers, each with 12 six- t-high units, are the most ad- ced automatic computing ma- ne yet devised, according to uglas.

They can perform 16,000 addi- ns or subtractions per second, l can multiply or divide more n 2000 ten-digit numbers per ond. The computers will be d to predict the performance of craft and missiles before they e actually built.

ompson Wire Building Plant

Thompson Wire Co., Boston, is ecting a plant at North Point road, near Wise avenue, Baltimore, for the production of strip. Work is scheduled for completion by the end of summer.

Drake Steel Plans Expansion

Ground is scheduled to be broken July 1 for a new office and warehouse as the Los Angeles headquarters for Drake Steel Supply Co. Completion of the project is scheduled for around Jan. 1. Site of its present plant was sold to Earle M. Jorgensen Co. All present buildings are to be sold or moved.

Develops New Type Tubing

An inner-finned tubing, new development in the heat transfer field, is in production at Bush Manufacturing Co., Hartford, Conn. It is designed for use in all types of air conditioning and commercial refrigeration products.

Metalworking Firms Merge

Salem-Brosius Inc. merged with American Cladmetals Co. The former company was formed recently by merging Salem Engineering Co., Salem, O., with Brosius Co., Pittsburgh. The new enterprise will be known as Salem-Brosius Inc. with American Cladmetals Co., Carnegie, Pa., operating as a division.

Sun Machinery Co. Moves

Sun Machinery Co., Los Angeles, moved to new quarters at Santa Fe avenue and Washington boulevard, that city.

Illinois Tool Appoints Agent

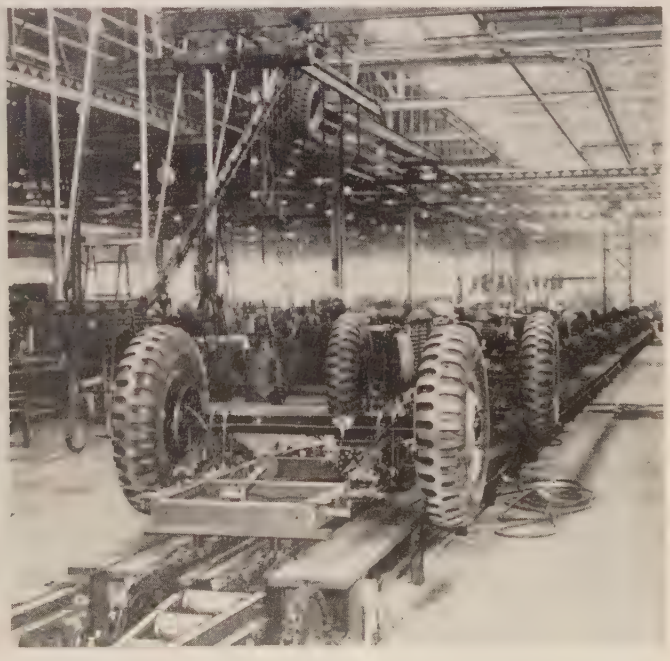
Illinois Tool Works, Chicago, appointed Truman E. Longley Co., Cleveland, as northern Ohio distributor for its Illinite standard and semistandard metal cutting tools.

Metal Products Firm Expanding

Miller Metal Products Co., Baltimore, manufacturer of metal kitchen cabinets, metal containers, etc., acquired 43,000 sq ft of space in a section of the former plant of Brookline Chemical Co. at Chesapeake avenue and Ninth street, that city. It will be used for warehouse space and light manufacture.

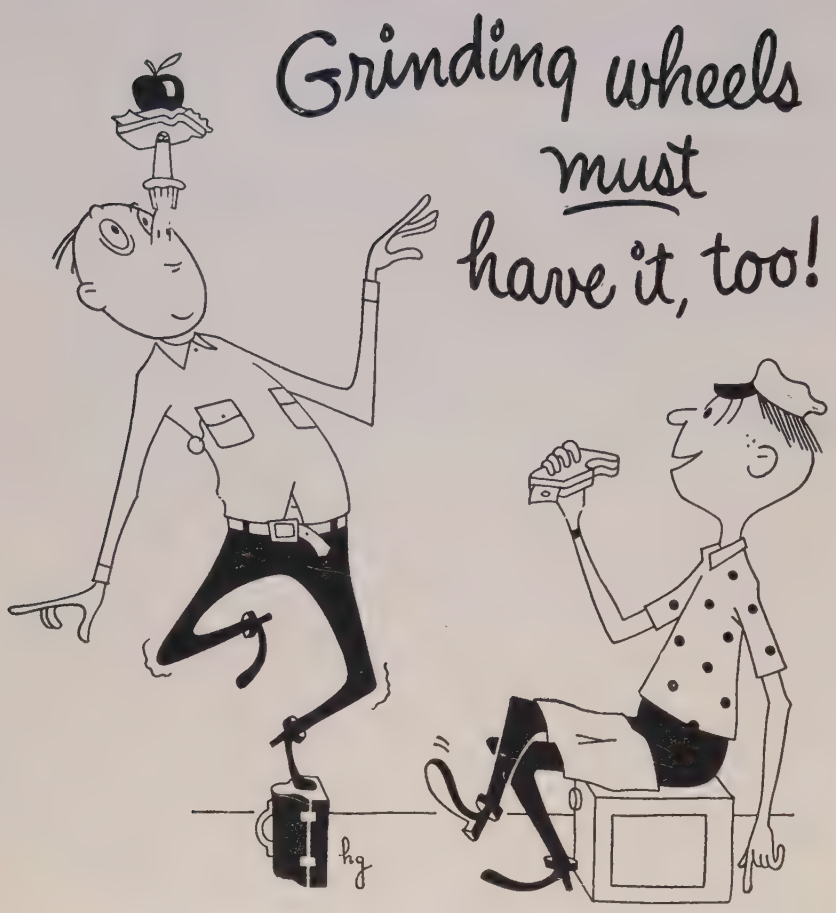
Petro Enters New Market

Entering the domestic gas heating field for the first time in its 50-



ilitary and Civilian Trailers Move on Adjacent Lines

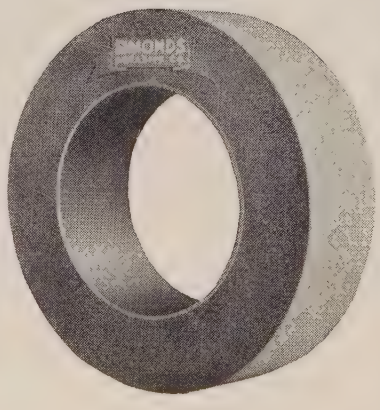
in precision production lines at Fruehauf Trailer Co.'s lf-mile-long plant at Avon Lake, O., are turning out itary and civilian trailers. Special military trailers are being produced on the line at the right; conventional highway freight units on the line at the left. Other assembly lines are building other trailers and truck bodies



SIMONDS ABRASIVE CO.

Grinding Wheels

Good balance, that is! And it's characteristic of Simonds Grinding wheels. It's in their physical balance for true running. It's in their economical balance between wheel cost and grinding results. It's in the versatile application of the line they represent. Your Simonds distributor carries balanced stocks including wheels for roughing, finishing, cutting-off and sharpening; abrasive polishing grain; segments for surfacing large flat areas or small pieces held together. Even if you need specially made wheels, he can help you. Write for his name and free data book.



SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON

DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N.Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

year history, Petro Division, I Fireman Mfg. Co., Cleveland, nounces two entirely new lines gas-fired furnaces.

Flexible Tubing Names Agent

Flexible Tubing Corp., Guilfo Conn., appointed Industrial Sup Co., Minneapolis, as a distribu for its line of flexible tubing.

Deere To Start Plant Expansio

Construction of the first u of a large Deere & Co. devel ment, which will cost several m lion dollars, will be started t month on a tract east of the dustrial area of Moline, Ill. T project will take several years complete.

Erie Mfg. Moves to Illinois

Operations of Erie Mfg. Divisi Pressed Steel Car Co. Inc. w moved to Melrose Park, Ill.

Builds $2 Million Plant in Nile

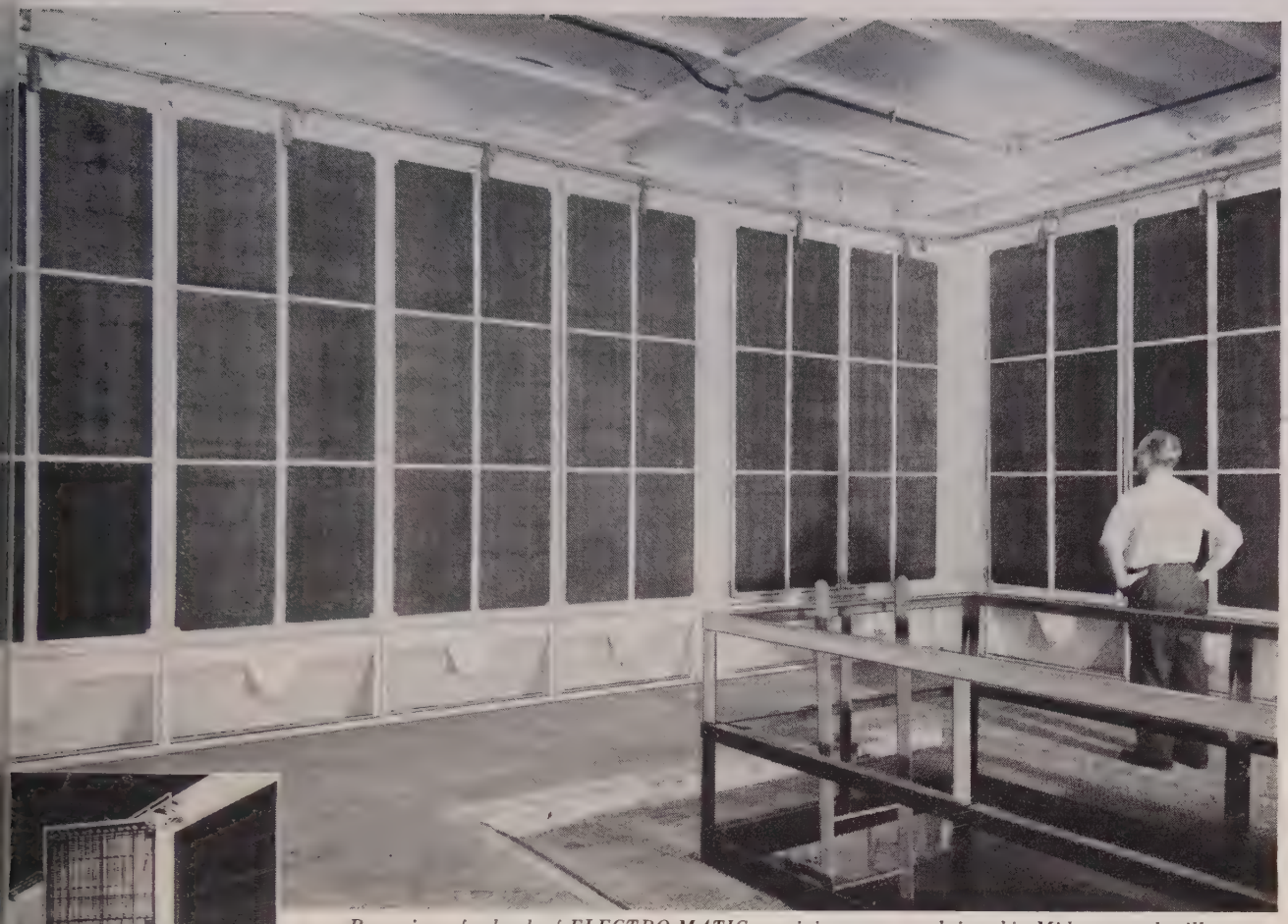
Vapor Heating Corp. and manufacturing subsidiary, Rc Mfg. Co., Chicago, are building $2 million plant in Niles, Ill. Pr ent plans call for occupancy January, 1954.

Philco To Build in Canada

Philco Corp. of Canada Ltd. w erect a plant in Toronto, Ont. will contain about 80,000 squ feet of floor space. Plant a equipment are expected to c about $1.5 million. Completion scheduled for early 1954 when r dio and television production f cilities will be moved to the n location.

Gets Sheet Metal Work

George Koch Sons' Inc., Eva ville, Ind., was awarded a $30 m lion subcontract for sheet me construction work on the Ato Energy Commission's new gase diffusion plant being built n Portsmouth, O. The award w made by Peter Kiewit Sons' C general construction contractor, a cost-plus-fixed-fee basis. T work will take about four years complete.



Rear view of a bank of ELECTRO-MATIC precipitators at work in a big Midwest steel mill.

t view of the steel mill CTRO-MATIC installation n above. Note the hinged r section opened which per- ready access to the rear of the r unit—and to the front col- r curtain.

e is a cutaway of the ELEC- MATIC Model "E-2" show- he construction details and rrangement of the various onents. The photo shows the ing of the collector plates makes the filter curtain non- ing—assuring a constant flow an air of uniform volume.

THE AAF ELECTRO-MATIC self-cleaning electronic precipitator provides a constant volume of

SUPER CLEAN AIR FOR MILL MOTORS

Clean Air—free from the most minute particles of dust, dirt or even smoke — keeps mill motors operating at top efficiency. The ELECTRO-MATIC stands guard against possible build-up of these minute particles on windings which can cause overheating or short circuits.

The development of the AAF ELECTRO-MATIC guaranteed industry an electronic precipitator cleaner that removes smoke and dust particles of such fractional micron sizes that its efficiency can be evaluated only by the discoloration method of testing developed by the U. S. Bureau of Standards.

The AAF ELECTRO-MATIC is the finest known electronic precipitator on the market. It has been so proven in numberless tests in many diversified industries. It is exceptionally effective, for example, in removing airborne bacteria, pollen, mold spores, oil mist and other minute air impurities.

The ELECTRO-MATIC is self-cleaning. This automatic maintenance feature is an important factor in all highly specialized industrial applications. For complete information and Experience Reports — write to the American Air Filter Company, Inc., and request Bulletin number 250.

expect the best from . . . . .

AAF

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COMPANY, INC.

443 Central Avenue, Louisville 8, Kentucky • American Air Filter of Canada, Ltd., Montreal, P. Q.

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ALUMINIZING
ANNEALING
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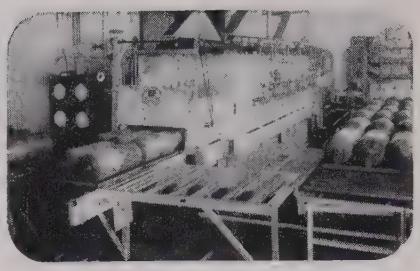
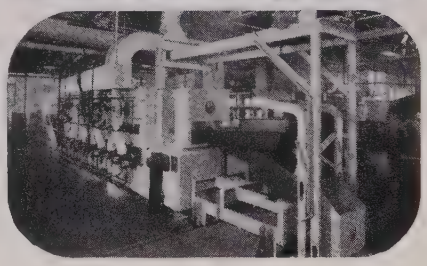
BRIGHT ANNEALING
CARBON RESTORATION
CARBURIZING
CERAMIC DECORATING
DRAWING
ENAMELING
GALVANIZING
HARDENING
HOMOGENIZING
MALLEABLIZING
NORMALIZING
NITRIDING
SINTERING
SOLUTION TREATING
STRESS RELIEVING
STRIP—ANY PROCESS
SPECIAL ATMOSPHERE TREATMENTS AND OTHER PROCESSING

Compressed gas cylinders or tanks are continuously normalized and annealed—scale-free in EF gas fired furnaces.

Bolts, springs and other products are scale free heat treated in EF continuous chain belt conveyor furnaces. 11 sizes—to handle from 125 to 2000 lbs. or more per hour.





EF PRODUCTION FURNACES

for these and other processes

Reflecting more than 30 years of continuous research, experience and outstanding engineering accomplishments, EF production furnaces combine high heating efficiency—accurate, automatically controlled cycles—high fuel economy—and produce products with uniform physicals and surface finish year after year.

For advanced engineering designs that minimize maintenance and produce high hourly outputs, turn your production furnace problems over to one of the experienced EF furnace engineers—**it pays.**

EF THE ELECTRIC FURNACE CO.
GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION
Salem - Ohio

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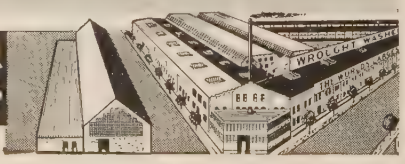
Geared to Industry's Production Demands Since 1887 . . .

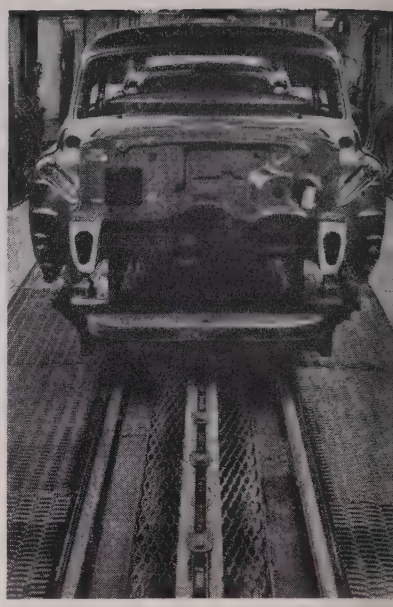
MILWAUKEE WROT WASHERS

Over a period of 65 years, producing standard and special washers of all types for all industries, we have made up more than 25,000 sets of dies . . . used in the production of washers which are stocked in thousands of different sizes. On special orders we will make up dies to your specifications.

Let us quote on your requirements for washers and stampings . . . covering fabrication in any material and any finish . . . machined, heat-treated or surface ground, as may be specified.

WROUGHT WASHER MANUFACTURING CO.
The World's Largest Producer of Washers
2103 S. BAY ST., MILWAUKEE 7, WIS.





Uses Metal Floor Panels

In this spray booth, built by We field Sheet Metal Works Inc., Ke worth, N. J., eight cars can be pai ed simultaneously in as many colo All excess sprayed paint is dra through the Wheeling expanded me grating, eliminating the possibil of deposit on any of the other c

Stamp Works Expands Facilitie

Parker Stamp Works Inc., Ha ford, Conn., erected a plant ad tion, increasing the firm's produ tion area by 46 per cent.

Slagle To Head Western Regio

Edwin L. Slagle, works indu trial engineer, Columbia-Gene Division, United States Steel Cor was nominated for the position western region vice president American Institute of Industr Engineers Inc., Columbus, O. T vice president serves on the n tional board of trustees and rects institute's regional affairs

Cleco Appoints Distributors

Cleco Division, Reed Roller Co., Houston, appointed as distr utors for its air tools and acc sories: F. C. Bishop Co. Inc., B falo; Flood & Calvert Inc., C veston, Tex.; Paterson Machin Co., Nashville, Tenn.

Fluor Corp. Gets Refinery Job

Standard Oil Co. of Califor awarded the Fluor Corp. Ltd., Angeles, a contract for the desi engineering and construction c

)0 bbl fluid catalytic cracking
, to be installed at the El Se-
lo, Calif., refinery. Comple-
is scheduled by August, 1954.

vo Sells Combustion Device

ravo Corp., Pittsburgh, was
ed sales and engineering rep-
ntative for a catalytic air-pol-
n control and heat recovery
ce produced by Oxy-Catalyst
Co. Inc., Wayne, Pa.

ker Building Chemical Plant

ooker Electrochemical Co.,
gara Falls, N. Y., is construct-
a $12 million plant at Mon-
e, Mich. The plant, scheduled
completion by the year's end,
make caustic soda and chlo-
.

l Expand Ship Repair Yard

Bethlehem Steel Co., Shipbuild-
Division, Baltimore Yard, 1100
Highway, Baltimore, has ac-
ed from the city 3.1 acres of
nt land on the waterfront at
foot of Hughes street and Key
way, which will be used to ex-
d the company's ship repair fa-
ies.

Distribute Surface Grinders

eid Bros. Co. Inc., Beverly,
s., appointed Lafayette Tool
Supply Co., Miami, Fla., as a
ler for its surface grinders.

co To Relocate Offices

dministrative, sales and adver-
ng headquarters of Nesco Inc.,
nufacturer of housewares and
l containers, will be moved
n Milwaukee to the firm's fac-
y at Jacksonville, Ill. The
ve will be made during June
l July. The firm's manufactur-
headquarters already are lo-
ed at the latter city.

rber-Colman Opens Branch

Barber-Colman Co., Rockford,
, opened a factory branch of-
at 537 Harden St., Colum-
, S. C. The company manufac-
es automatic control and air
tribution products. Recently
pointed service engineers and
territories they serve for the

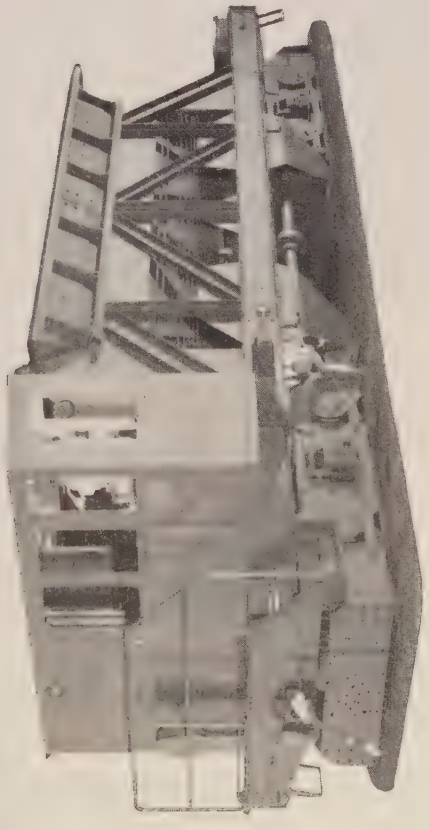
FOR THE VERY BEST
See ATLAS

TRANSFERS - SCALE CARS
COAL CHARGERS - COKE QUENCHERS

60-TON BOTTOM DUMP ORE TRANSFER CAR

This is one of the latest Atlas Transfer Car designs arranged for modern hydraulic operation. It provides close control of the discharge and eliminates freezing of air lines in the winter. A hydraulically operated pusher arm is provided of the latest horizontal telescoping type. The brakes also are hydraulically operated and apply automatically if pressure is low or if power fails.

At this plant the car must cross over to the coke track to shift coke cars. There is no conductor rail on the coke track so the car is equipped with a motor-driven cable reel attachment, enabling it to perform this switching function. When operating on the cable reel the collector shoes are cut out and automatically raised off of the conductor rails. The cab is overhung to give the operator a line of vision down the side of the car.

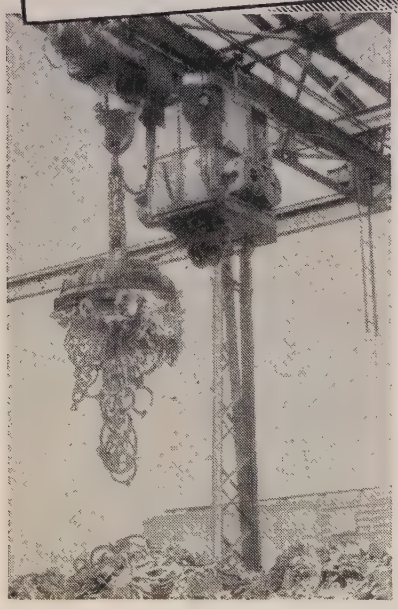


THE ATLAS CAR & MFG. CO.
ENGINEERS and MANUFACTURERS
1100 IVANHOE ROAD CLEVELAND 10, OHIO

SHEPARD NILES
Floor-Operated Hoist

Operator mainly occupied with other duties. Hoist used for fast, efficient handling of relatively short hauls.

WHICH HOIST is RIGHT FOR YOUR JOB?



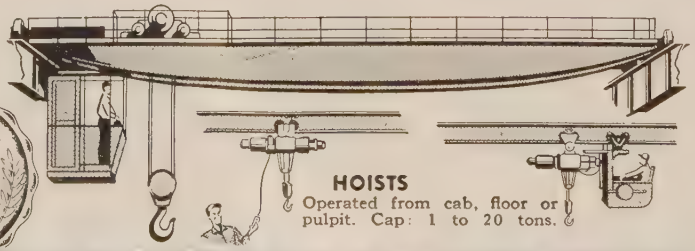
SHEPARD NILES
Cab-Operated Hoist

Operator in cab moves loads along at high speeds—occupies best vantage point for spotting or stacking materials.

Choosing the hoist that's right for your job calls for expert advice.

Let the Shepard Niles representative in your area guide you in your choice. He specializes in through-the-air handling—can help you select the hoist that best fits your job. Write Shepard Niles today for latest bulletins describing both types of hoists—and ask to have a representative stop by your office.

CRANES
Overhead: Top running, inner running, under running, floor or cab operated. Cap: 1 to 450 tons.



50th ANNIVERSARY
SHEPARD NILES CRANE & HOIST CORP.
1903-1953

HOISTS
Operated from cab, floor or pulpit. Cap: 1 to 20 tons.

SHEPARD NILES
CRANE AND HOIST CORPORATION
2324 SCHUYLER AVENUE, MONTOUR FALLS, N.Y.

Nickel Deposit Proven

Test borings with auger bits su as this disclosed a large depo of nickel near Moa Bay, Cuba. subsidiary of Freeport Sulphur C has proven existence of at lea 40 million tons of ore containi nickel, cobalt and other meta

firm's Wheelco Instruments Div son are: James Heinlen, Cinci nati; James J. Hoffman Jr., Clev land; D. J. Paker, Omaha, Nebr Vernon N. Jennings, Tulsa, Okl

Cavert Wire Co. Changes Hands

Meyer L. Swimmer and his so Wolford Swimmer of Uniontow Pa., acquired Cavert Wire Co., E wood City, Pa. This compa manufactures steel wire bale ti spooled wire for automatic bale and annealed steel baling wi The new owners plan to expa the firm's markets and to devel and produce new wire products.

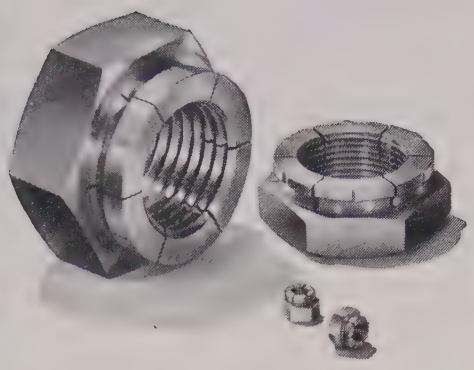
Will Build Plant in California

Minneapolis - Honeywell Reg lator Co. Minneapolis, will build plant at 174th street and Weste avenue, Gardena, Calif., for ma facture of automatic controls.

Permutit Moves Sales Office

Permutit Co., New York, ma facturer of industrial and hou hold ion exchange equipment a resins for water conditioning plications, moved its Los Ange sales office to 302-B Brand Bl Glendale 4, Calif.

PHILADELPHIA TRANSPORTATION COMPANY, Philadelphia, Pa., uses FLEXLOC Self-Locking Nuts on the rear axle flanges of its buses. This carrier has found that FLEXLOCs eliminate sheared studs, reduce maintenance, save time and money.



How FLEXLOC locknuts work

FLEXLOCs lock and stay put on a threaded member regardless of the vibration encountered. Here's how they work. The slotted top or locking section is divided into six equal, flexible segments, closed in to make the inside diameter of the nut smaller than that of the companion bolt. When the FLEXLOC is applied, these are expanded by the bolt. The spring tension of the resilient segments locks the nut securely at any desired position on the bolt once the locking threads are fully engaged.

FLEXLOCs can be used over and over again. When expanded by the bolt, the locking section remains within the elastic limit of the metal. This permits the locking segments to return to their normal position, ready for reapplication to the bolt.

FLEXLOCs are one piece, all metal—nothing to assemble, come apart, lose or forget. They can be delivered in any quantity in a wide range of sizes. Stocks are carried by industrial distributors everywhere. Write for literature and samples. SPS, Jenkintown 33, Pa.

FLEXLOC®

LOCKNUT DIVISION

SPS

JENKINTOWN PENNSYLVANIA

Our Fiftieth Year : A START FOR THE FUTURE

Vard Expands Department

To facilitate its newly instituted plan of market product development, Vard Inc., Pasadena, Calif., has moved its entire engineering department into a building which has been constructed on a site adjoining other Vard properties on Foothill boulevard. The company is active in all branches of industrial design, tooling and manufacturing. Special projects, laboratories and testing equipment remain in the main building at 2981 Colorado St., Pasadena.

Eutectic Opens Branch Office

Eutectic Welding Alloys Corp., Flushing, N. Y., established an eastern divisional office at 1060 Broad St., Newark, N. J. Herman J. Greif is the eastern divisonal sales manager. The company makes welding alloys, electrodes and fluxes.

Brazing Department Enlarged

Joseph E. Lewis & Co. Inc., Baltimore, tube bending machinery, indirect tankless water heaters, etc., leased 5000 sq ft on West street into which it has moved its less active equipment and some raw materials. The space thus vacated has provided for the addition of a gas furnace and conveyor line in the company's brazing department.

Isenberg Elevated to Presidency

Combustion Engineering-Superheater Inc., New York, changed its name to Combustion Engineering Inc. Martens H. Isenberg was elected president, succeeding Joseph V. Santry who was elected chairman of the board.

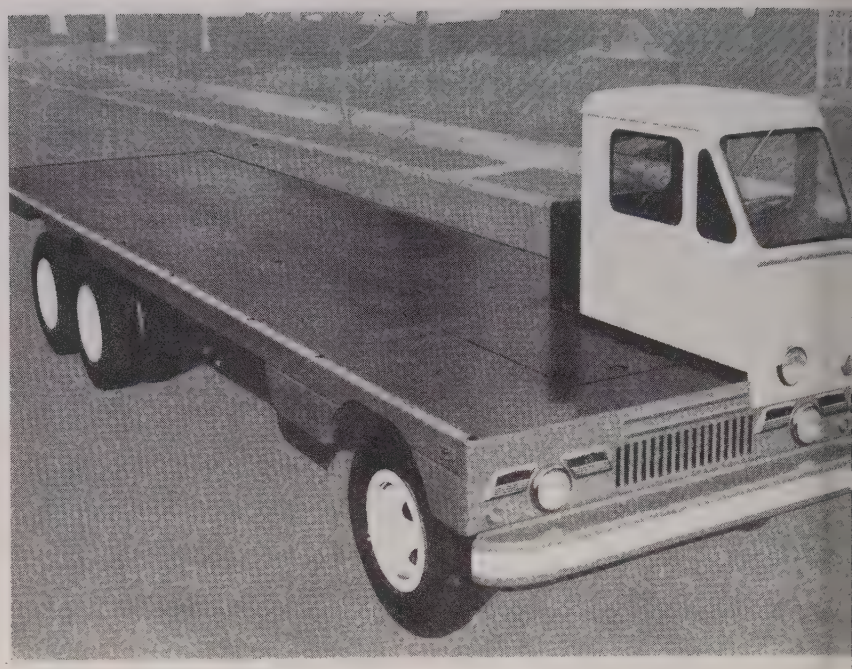
Still Offers Hydraulic Units

Sundstrand Machine Tool Co., Rockford, Ill., continues to make hydraulic equipment for applications to mobile equipment used in materials handling, road building, etc. In addition, Sundstrand is maufacturing hydraulic accessories for aircraft.

Purchase by Parker Appliance Co., Cleveland, as reported in the Apr. 13 issue of STEEL, was confined to the JIC line of hydraulic accessories for machine tools formerly made and in process of development by Sundstrand's Hydraulic Division.

At the time of the purchase, S. B. Taylor, president, Parker Appliance Co., said: "We are acquiring all of the pumps and valves and special hydraulic units formerly built by Sundstrand for application to machine tools. These products . . . will be augmented with additional developments already well under way in our own Industrial Hydraulic Division in Cleveland. The net result should be that Parker very shortly will be able to offer machine tool manufacturers a broad line of hydraulic accessories."

Bruce F. Olson, president, Sundstrand Machine Tool Co., expressed gratification that "the supply of these products for use on machine tools will be continued by a reliable company such as Parker. This does not affect our production of hydraulic products for other uses nor our production of oil burner fuel units, and enables us to proceed with our policy of product diversification and concentration on specialized mobile equipment hydraulics."



Truckmaker Adopts Flat-top Design

A heavy-duty cargo truck that looks like a highway-borne aircraft car is being manufactured by Murty Bros., Portland, Oreg. The deck, broken o by the cab "island," permits transportation of pipe, structural steel o other long cargo that otherwise would require a tractor and semitra

Stove Production Increases

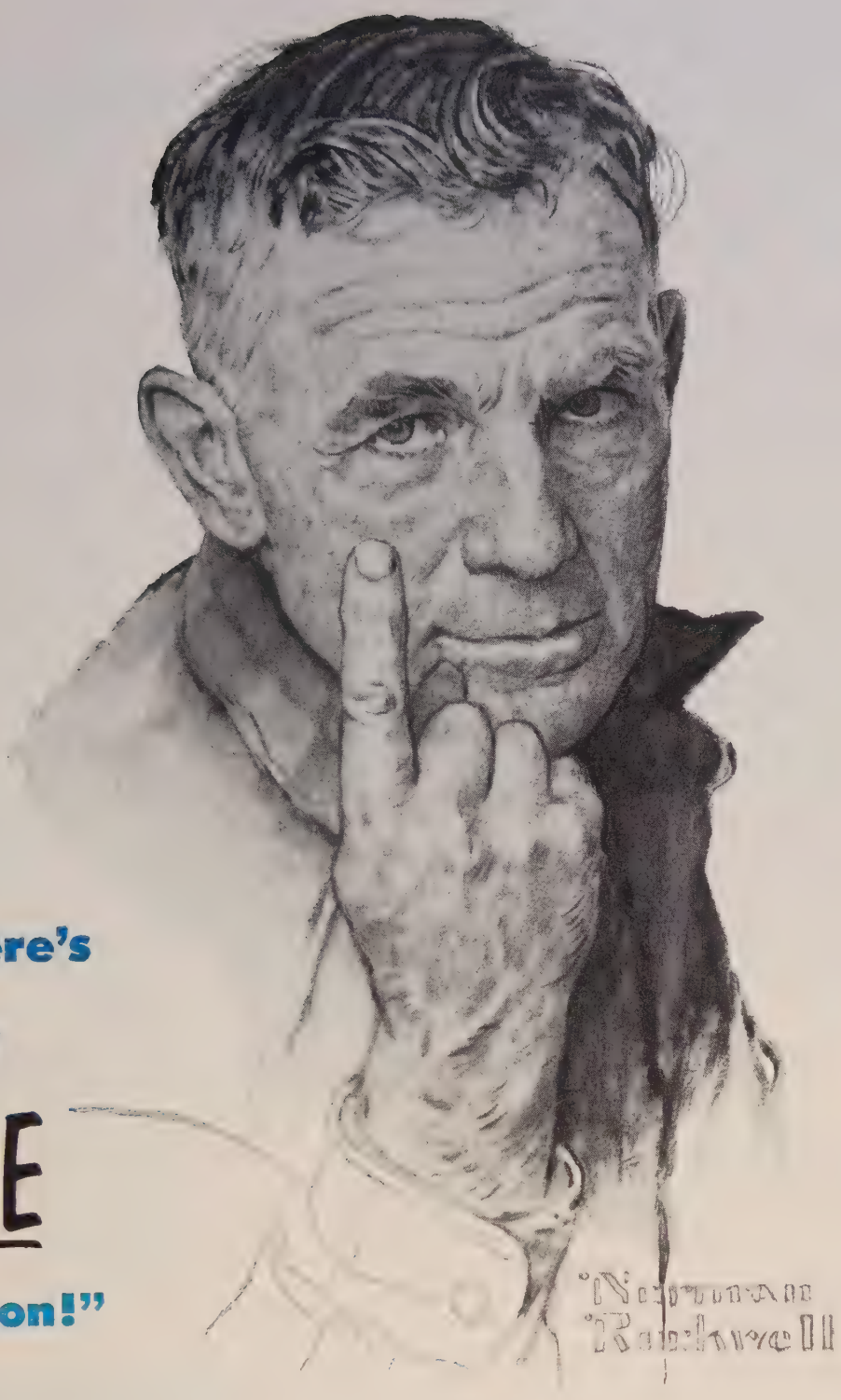
RCA Estate Appliance Co Hamilton, O., has spent $1 mill in plant modernization since purchase of the business fr Estate Stove Co. last Novemb Stove production has climbed per cent and the goal is to dou output by the yearend. Ab $500,000 is being spent for ret ing for the 1954 models.

Airplane Makers Merge

Merger of Luscombe Airpl Corp., Dallas, with and into T co Aircraft Corp., that city, been completed. Luscombe is r known as the Garland plant Temco Aircraft Corp.

Nesco To Lift Heater Output

Nesco Inc., transferred its ware department from its Ba more plant to another of the c pany's plants, and will utilize space thus provided for the ma facture of oil stove room heat The Baltimore plant produ trash, garbage and oil cans; ister sets; wash tubs; buck waste paper baskets and sim items. General offices are in waukee.



"There's only ONE reason!"

'S JUST THAT SIMPLE. There's only one reason in the orld why 2 out of 3 wire rope users in the industrial field efer Roebling wire rope... *it costs a lot less on the job an any other.*

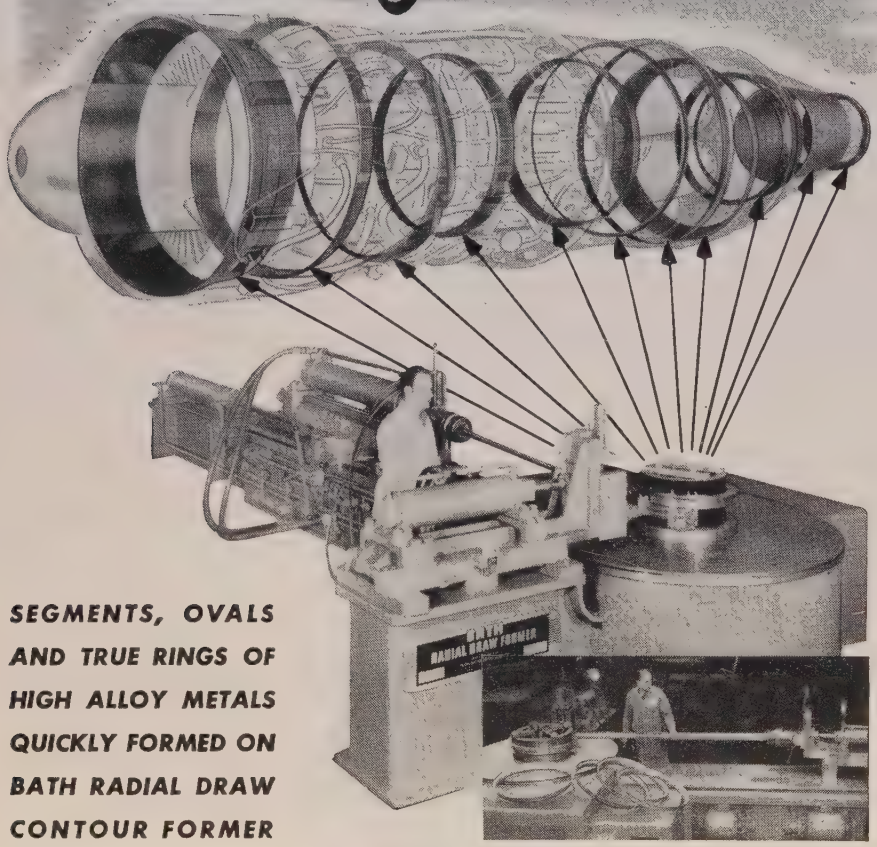
For maximum wire rope efficiency and economy, call your arest Roebling office for a Field Man. He'll recommend e best ropes for your operations.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

HN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSE-LT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • USTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2NÓ ST. • PHILA-LPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, ENTON 2, N. J.

ADVANCED TECHNIQUE in Jet Ring Production



SEGMENTS, OVALS AND TRUE RINGS OF HIGH ALLOY METALS QUICKLY FORMED ON BATH RADIAL DRAW CONTOUR FORMER

Far ahead of the field in design concept, the BATH RADIAL DRAW CONTOUR FORMER will form turbo-jet compressor and afterburner members, guided missile rings and aircraft wing and fuselage sections of variable contour and cross sections. The rings and parts are true and within the precision tolerances demanded of aircraft components.

BATH RADIAL DRAW FORMING shows more pounds of critical material and weight saved per 1000 pounds of engine thrust than any other forming method.

Recognized as fast and efficient, it has been accepted as a development of vital importance in U. S. armament programs. Forming facilities are available, send prints for quotes.

Machine capacities from 12½ to 200 tons in standard Models. Write for catalog CF-352.

THE CYRIL BATH COMPANY

MANUFACTURERS of METAL FORMING MACHINERY

6972 MACHINERY AVE. • CLEVELAND 3, OHIO

Phillips Aids Manufacturers

Maj. Gen. J. F. Phillips (Ret.) recently commanding general o the Air Force's Cambridge Re search Center, has joined the tech nical service of the Aircraft In dustries Association in Washing ton where he will co-ordinate ac tivities of the association's newly organized guided missile commit tee. This committee will act i behalf of guided missile manufac turers on collective problems re garding research, engineering, de sign, development, constructio and testing of guided missiles.

Los Angeles Building at Peak

The pace of construction in Lo Angeles county is faster than eve in history. With valuation of con struction in March totaling $133, 242,173, and the total for the quar ter well above 1950 records (banner year), local constructio observers predict 1953 will be record year for construction.

Holds Spray Painting Classes

Binks Mfg. Co., Chicago, wi conduct spray painting classes th summer. There will be four on week sessions, beginning July at the company's plant at 4915 Pa cific Blvd., Los Angeles.

Will Sell Welding Products

Welding Products Division, A. Smith Corp., Milwaukee, appointe as distributors of its welding ele trodes, machines and accessorie Pensacola Welding Supply Co Pensacola Fla.; Worland Oxyge Co., Worland, Wyo.; Guilfor Welding Supply Co., Baltimore.

Federal Electric Expanding

A new manufacturing plant Federal Electric Products Co Newark, N. J. is scheduled to beg operations in September. The million plant, now under constru tion in Scranton, Pa., will man facture heavy power and tran mission switch gear. The compa will operate additional manufa turing facilities soon in Clevela and Los Angeles as part of i long-range program of expansi and diversification.

2-HIGH

TEMPER

PASS MILL

rolling

stainless steel

Designed and Built by

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON

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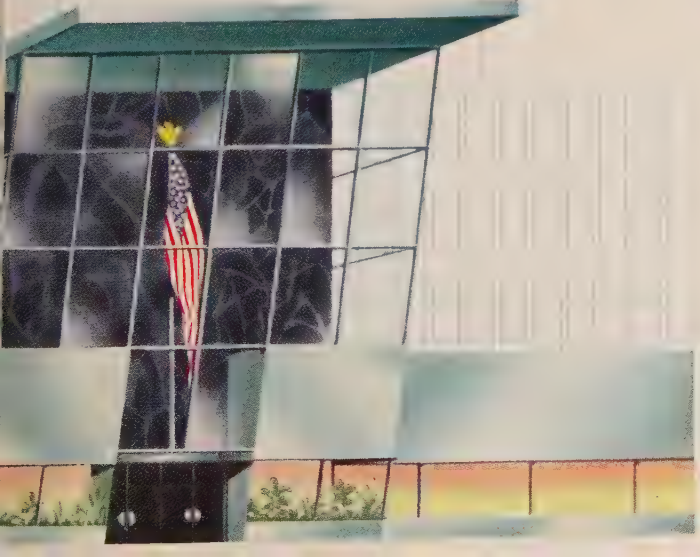
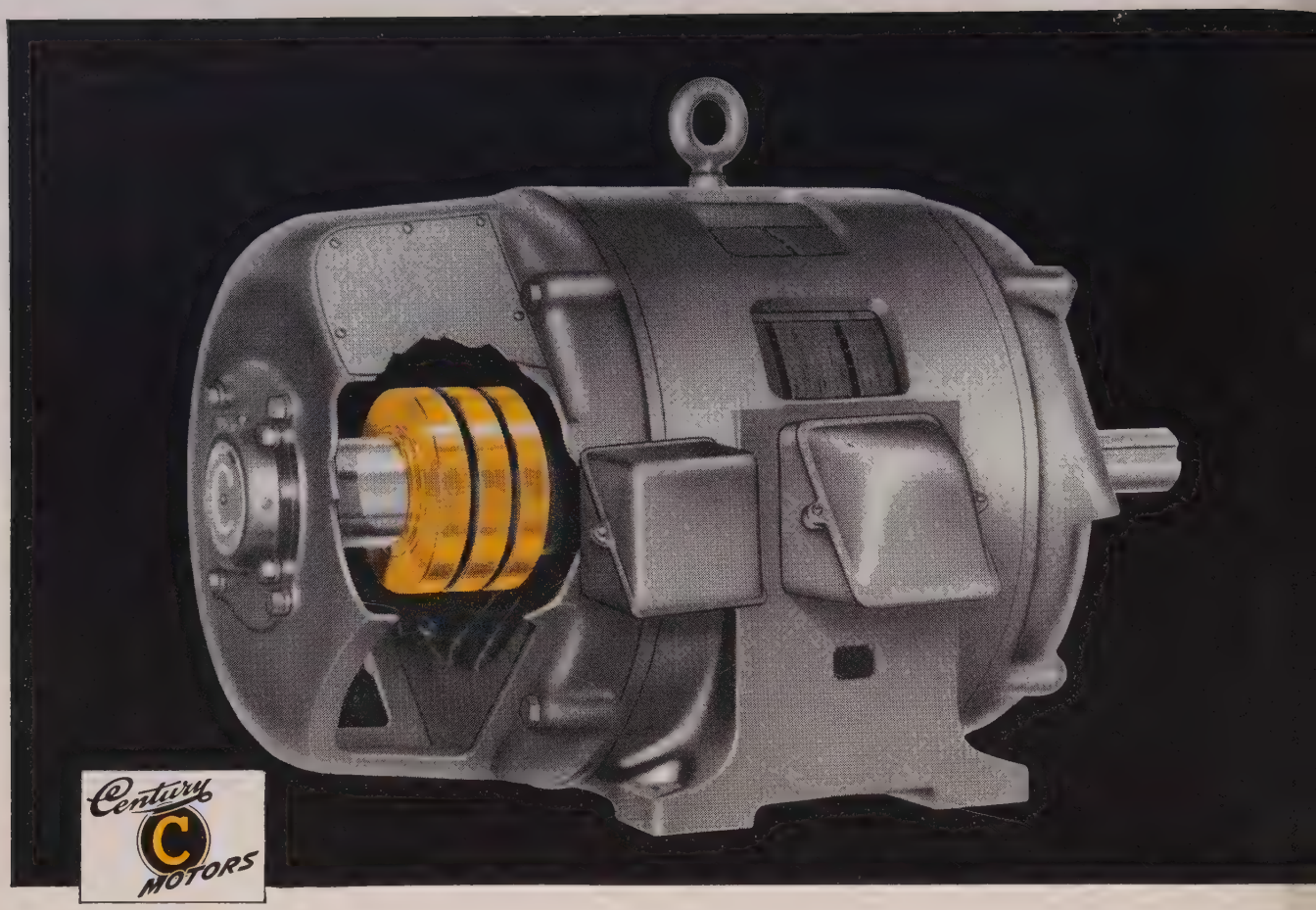
Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

STAINLESS STEEL BUILDING ENTRANCE



UNITED *can serve you no matter where in the world you are.*

®



perfect contact at high speed

Through Advanced Casting Techniques, We Help Our Customers to Better Serve Their Customers.

Bronze collector rings, like these, are important power transmission factors in electric motors—such as those produced by Century Electric Company, St. Louis, Missouri. Making high speed revolutions with the armature, collector rings must be perfect, as sand inclusions, pits, or other flaws cause arcing, with subsequent loss of motor power.

Century Electric Company, leading manufacturer of quality electric motors, generators, and related equipment, was aware of National Bearing Division's outstanding reputation for quality copper-base castings, using advanced foundry techniques and mass production.

Century was confident we could produce, as specified, flawless bronze collector rings for use in their products.

And their confidence was justified.

Our modern, centrifugal, permanent mold technique enables us to exactly meet Century Electric's specifications. This advanced foundry method eliminates sand molds for castings such as these. The bronze is tough and dense, and rings are cast close to size, minimizing machining. And Century enjoys dollar savings through our production-run economies.

Most important to them, however, is the fact that they are now providing their customers with equipment that includes collector rings of the highest quality.

If your product requires precision-cast bronze or other copper-base components, it will pay you to investigate National Bearing Division. We produce copper-base castings, large or small, with or without machining. And our production-run economies will probably save you money.

Write National Bearing Division for full information and your copy of our catalog.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4925 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

Production and Engineering
NEWS AT A GLANCE

ALUMINUM HELPS—Russian steelmakers claim that transformer sheets made with 3.5-6.5 aluminum and 2-3 per cent manganese compare favorably with silicon transformer alloys as far as their magnetic properties are concerned and are definitely superior in their capacity to be cold worked. Reported tests show that after a 90 per cent cold reduction transformer sheets analyzing 3.5 per cent aluminum and about 2 per cent manganese have a hardness of approximately 145 Brinell, while the hardness of 4 per cent silicon transformer sheets, cold worked only 83 per cent, is about 205 Brinell. They also report the use of aluminum as an alloying element to conserve tungsten in the manufacture of Mo-Cr-V-W tool steel. The scanty data if corroborated by tests in this country may achieve commercial significance.

KNOCKDOWN SAVINGS—Purchasing passenger car frames in the knockdown condition enables Chevrolet to ship four times as many frames per freight car as is normally possible. At the GM division's 11 assembly plants the components are riveted together into one assembly generally with hydraulic riveters. Due to the accurate prelocating of the holes in the component members the frames draw up to shape and size. Efficiency of the operation is evidenced by an assembly rate of 66 finished frames per hour. p. 98

SOURCE OF TROUBLE—Hydrogen is known to have a detrimental effect on the physical properties of steel forgings. Since hydrogen will effuse from steel at room temperature, defects in steel such as embrittlement, porosity, flaking, and cracking have been attributed, at least partially, to the presence of hydrogen. Although the hydrogen comes out of steel at room temperature, it is a relatively slow process and may require years to attain in the case of large forgings. Obtaining accurate hydrogen analyses of steel presents several problems. Since the hydrogen content of steel seldom exceeds ten parts per million extreme precautions must be taken during sample preparation and analysis. Westinghouse research workers have developed a method for determination of hydrogen in steel forgings by warm vacuum extraction and mass spectrometer analysis. The new method is proving useful for evaluating methods for reduction of elimination of hydrogen in steel.

THE GAP—Strong efforts are still being made to unite the Joint Industry Conference electrical standards with those of the National Electrical Code. Machine tool builders have been using the latter for some time and still do except in the cases where JIC is required. One of the reasons for a delay in uniting the codes is the gap or disagreement in some areas. One area is that of group fusing. NE code says that a fuse no greater than 100 amps can be used in a 440 volt hookup nor 200 amps for 220 volts. This provision isn't covered in JIC. Agreement here and in several other areas would no doubt result in the adoption of one code for all and would simplify the equipment builders' problems.

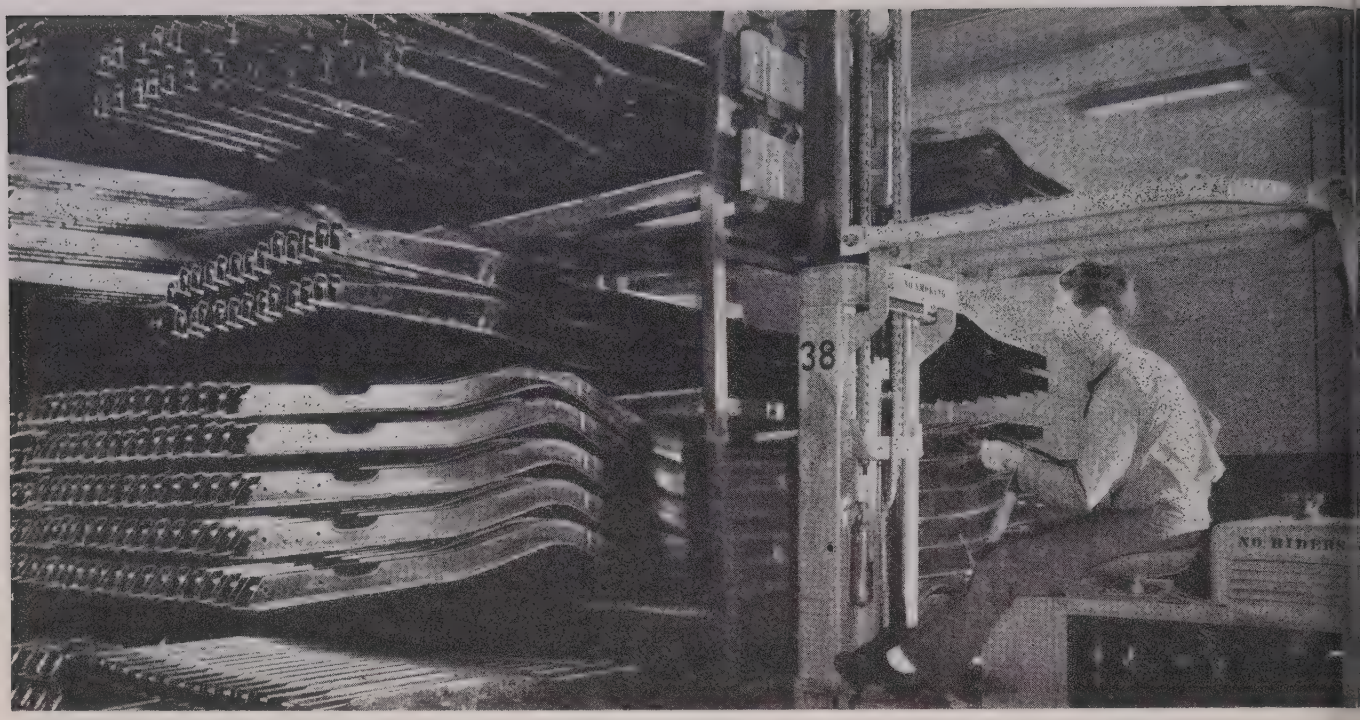
NEW ALUMINUM ALLOY—Aluminum-copper-cadmium alloys rolled to sheet form have showed an exceptional capacity for hot work. Aging characteristics have been examined and an uncoated alloy with 5 per cent copper-0.15 per cent cadmium gave 25 tons/sq. in. for the 0.1 per cent proof stress and 30 tons/sq. in. maximum stress in both the traverse and longitudinal directions. Aluminum-copper-cadmium alloys were immune from stress corrosion encountered with aluminum-copper alloys as a result of intercrystalline corrosion.

NOTHING DOES A LOT—Vacuum furnaces have moved out of the laboratory into commercial operation. Some manufacturers are now remelting forging scrap of high temperature alloys in vacuum. This scrap—often as much as 40 to 60 per cent of the ingot—previously had been sold at a heavy loss because it was impossible to determine the loss of trace components under normal melting procedure. The scrap can now be used as a fully acceptable component of a new batch of alloy. Titanium, zirconium and hafnium can be refined only by vacuum processing because of their exceptional oxidizing and reactive properties. Indications are that magnetic alloys will be twice as powerful as normal if processed in vacuum. Vacuum processing of many conventional metals, by eliminating gases, makes alloying agents more effective.

CARBIDE DIES—Sintered carbides as materials for dies are gaining considerable acceptance for many metalworking operations. Blocking an even faster rate of growth is the shortage of designers and manufacturers with a complete enough understanding of the material to take advantage of its qualities. Many of the factors influencing the selection and proper usage of carbides for dies are explained by an expert in the field. An understanding of these factors will help in determining where carbides will pay for themselves despite a higher original investment. p. 100

EXECUTIVE COMMUNICATIONS — Interior communications without placing an additional burden on existing telephone lines are a feature of the "Executive Station." Automatic dialing and ringing are provided on the independent four-wire system and conferences may be held without the participants leaving their desks. Coupled with a Select-O-Phone system, the unit makes it possible for the executive to talk to or from 1 to 20 stations without even spinning a dial.

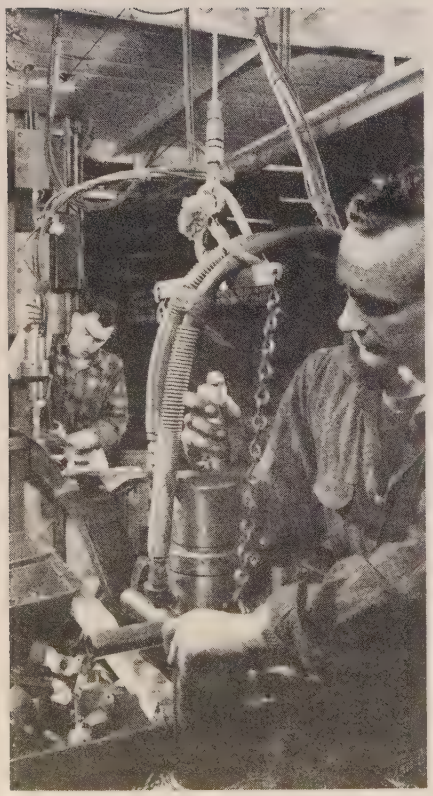
talworking Outlook—p. 47 Market Outlook—p. 157



Unloaded from the box car, the automobile frame side members are placed in racks and moved by fork lift trucks to a storage area which is adjacent to the frame line. Waste space is kept to a minimum in storing and shipping

Frame Assembly Cuts Shipping Costs

Purchase of automobile frames as components pays off in lower shipping costs. Ability of components to snuggle results in less air per carload



Hydraulic pull-up riveter works in the foreground; yoke riveter in the back. All rivets are cold squeezed

PASSENGER-CAR frames are bought in the knockdown condition and are put together in Chevrolet's 11 assembly plants.

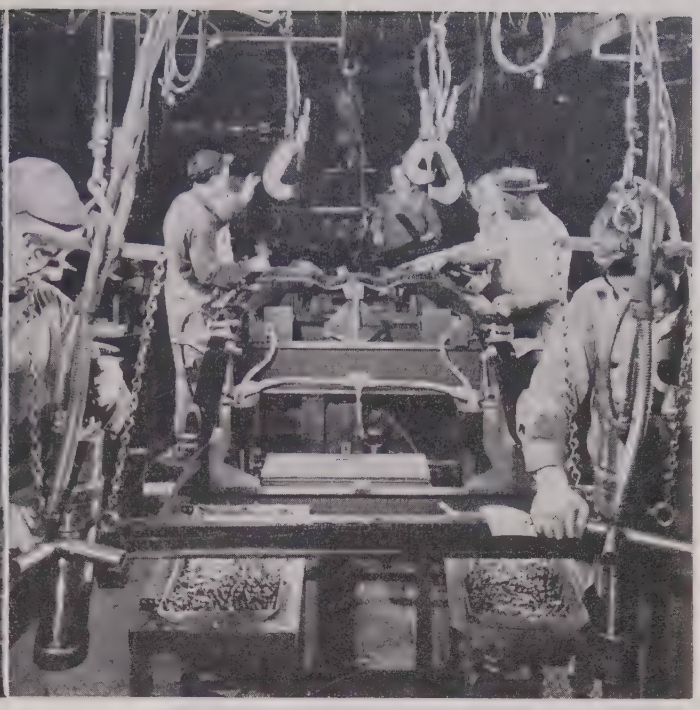
Biggest reason for not purchasing completed assemblies from the supplier is saving space in shipping. With the frames in the knockdown form, components for about 400 complete frames can be shipped in one car. That's about four times the number of assembled frames which can be put in the same space. It boils down to shipping less air per car.

Knockdown frames are scheduled into the various assembly plants by the carload in accordance with the schedules of each plant. While each plant has its own method of starting the assembly operations, always with the assembly of the frame, the basic method is the same.

Handy Area—As the component parts are unloaded from cars at the assembly plants, they are stacked adjacent to the start of the frame-assembly line. Assemblers then take side members, equipped with a bracket and a spring hanger, to the start of the line.

Side members are racked on either side of the frame buck and moved into position. Braces and cross members are positioned and all components are lined up on the buck. Length of frame governs number of cross members.

Pulls to Shape—All components line up on the buck and are riveted together into one assembly. Due to the accurate prelocating of the holes in the component members, the frames draw up to shape and size. A large number of hydraulic riveters made by Hannifin



le members and smaller frame parts are readied for loading from box car at the Chevrolet Flint assembly ant. Each car holds up to 400 complete frame sets

At start of assembly line side members, two brackets and spring hangers riveted on, are positioned in buck. Cross members are placed and assembly is cold riveted

rp., Chicago, are used for this eration.

In some cases, the front axle is aced on the buck at the same ne. It is bolted, however, in- ead of being riveted. This is to cilitate service operations which ay be necessary later. All other members are cold riveted in place to insure solidity of the frame.

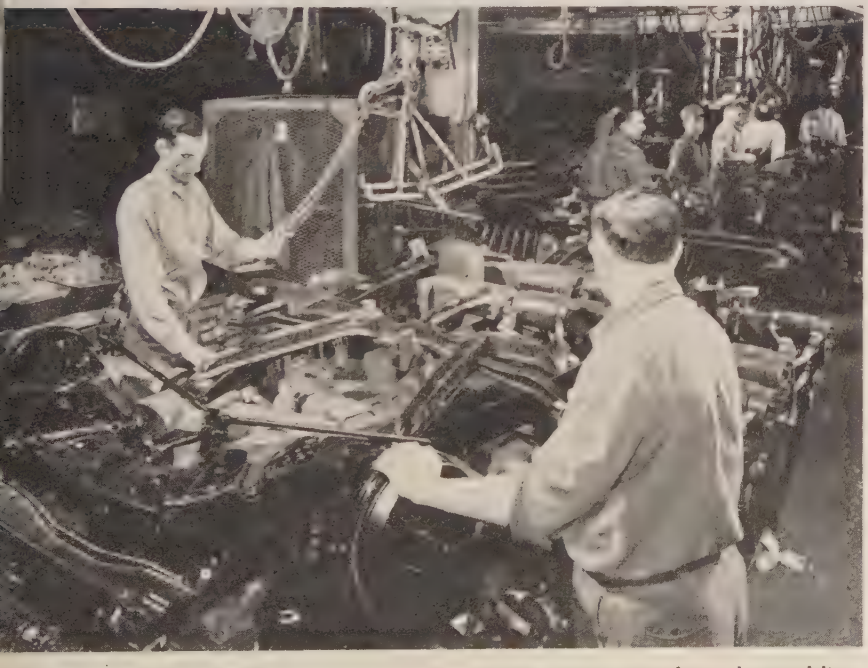
Bottoms Up—In almost all cases the frame is assembled upside down. Thus installation of rear springs, rear axle with propeller shaft attached, and such items as the hydraulic lines is made easy as the frame moves down the line. Frame is then turned over, using an electric hoist and a chain on a pulley. Inverting the frame is a one-man operation.

After cross members and braces are in position, brackets are projection welded to the side members. These constitute supports for the various supplementary installations connected with the body.

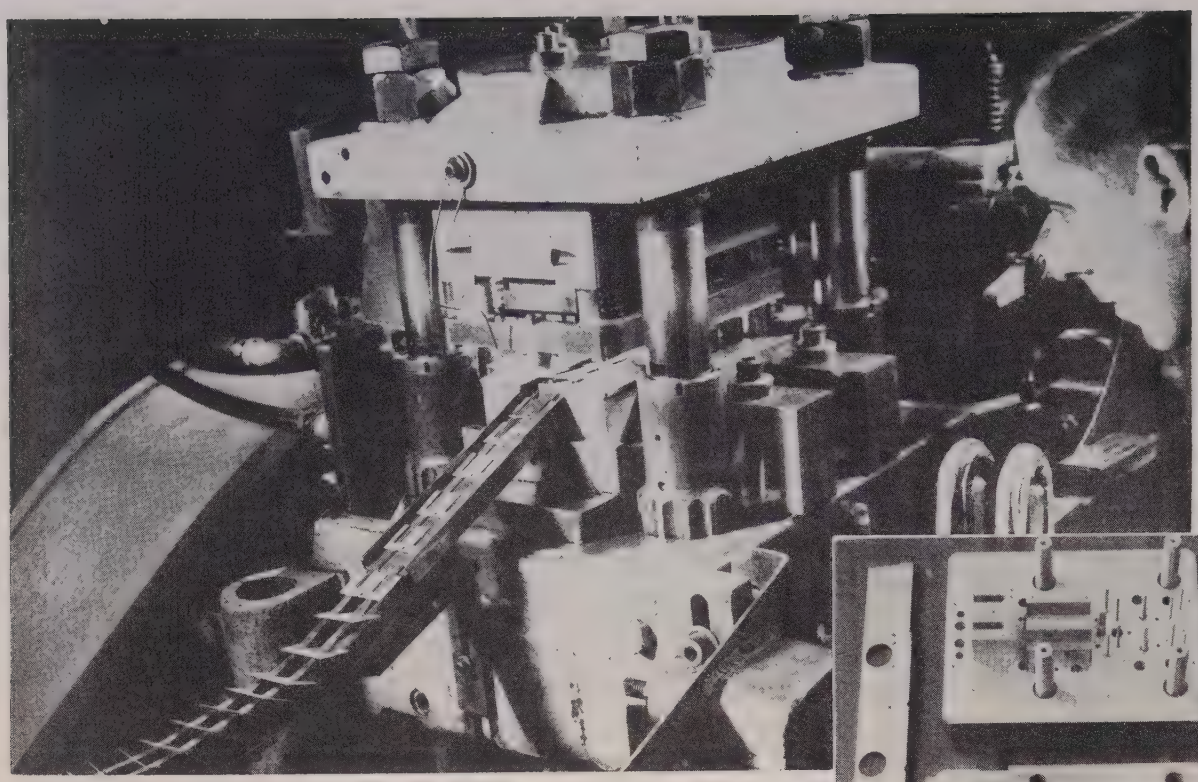
Trucks Too—Just before the body drop, the frame passes through a paint-spray booth where brackets and all other parts receive a coat of protective black enamel. Finished automobile frames roll off the line at a rate of 66 per hour.

Same basic operation also applies to the Chevrolet truck line. With its wide variation in frame lengths ranging from 155 to 212-inch wheelbase, and the resulting wide variation in assembly schedules, this method is particularly applicable.

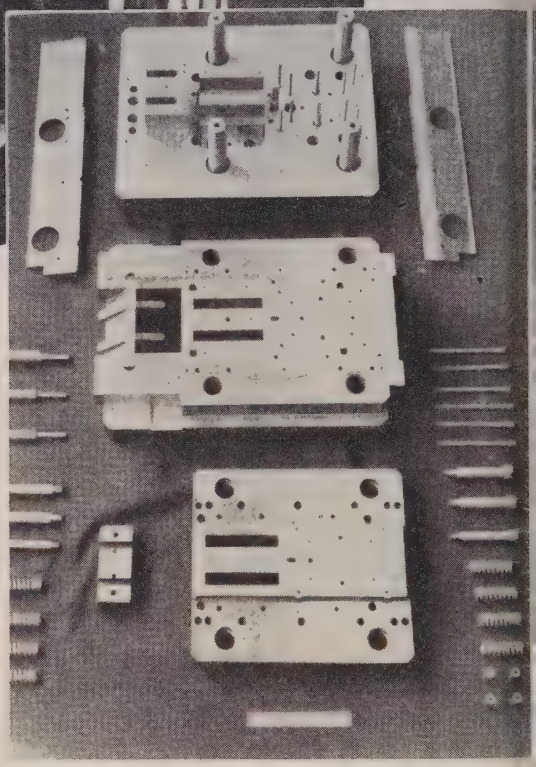
Only exception to the system in the Chevrolet operation occurs in the case of the frame for convertibles. This frame is equipped with a heavy X-member for extra rigidity and is bought in the assembled form.



mediately after frame buck in background, frame is moved to the welding ck. Here thirteen brackets are projection welded to frame automatically



This high-speed dieing machine with many specially designed features turns out 44,000 stamped laminations every hour. It produces two "E" and two "I" pieces with every stroke. A complete knockdown of such a die is shown in photo at the right



Long Life Promotes Carbide Blanking Dies

Development ideas continue to boost wider usage. Big block is lack of die designers and manufacturers who have the background for close-tolerance work

By NORMAN W. OBERG
Die Engineer
Kennametal Inc.
Latrobe, Pa.

SINCE INTRODUCTION of sintered tungsten carbide as a material for fabrication of blanking dies fifteen years ago, many new and interesting developments have taken and are continuing to take place in the field. The material today is finding ever increasing acceptance as its properties of long life together with excellent wear, shock and impact resistance spell lowered production costs for progressive managements.

First and most important is die design and construction. Basically, design of both steel and carbide dies is the same except for methods used to hold the carbide. An extremely serious problem exists today for manufacturers of transformers, electric motors, generators, etc. in that there are not enough tool and die manufacturers in the United States having the proper background for designing and building dies to very close tolerances.

For Example—Some diemakers still use soft punch blocks, soft strippers, dowels, bronze bushings for leader pins, straight punches and even tunnel strippers. During today's high production runs, where press speeds have been increased from 100-200 to 400-600 strokes per minute, ample strength must be built into the entire die. The day of staking punches to better the alignment is gone forever.

Soft strippers can't stand the steady pounding and today strip-

rs are being fully ground to help ide punches as small as 0.030- h in diameter. Dowels are too sleading in that we are blanking 005 and 0.001-inch material. It's rd to remember ever having seen dowel that couldn't be moved. onze bushings still have their ace but not in a high-speed press. recent review with three lead- g manufacturers of motor and nsformer laminations brought is point forcibly to light.

Solving Alignment Problems—ll cages used in conjunction th pins and bushings of high- rbon high-chrome steel with 0015 to 0.002-inch preload, found to a very close tolerance d hardened to 60-62 Rockwell-C ll solve many alignment prob- ms—sometimes regardless of the ess worn condition. Construc- on of dies for blanking should as thick as the shut height of e press will allow, unless you are anking 20 per cent or less of ur press' rated blanking pres- re. For example, if a part to be anked has a blanking pressure four tons, and is going to be n in a 25-ton rated press, it ould not be necessary, as far as erformance is concerned, to fill p the 8½-inch of shut height ith the die.

Taper punches are universally roving their worth especially in e blanking of transformer ma- rial. Main reason for their suc- ess is the ease of maintaining roper radial clearance. Special are has to be taken throughout hen using this type of punch es- ecially in the press room. Inter- hangeability of parts in the punch nd die are of the utmost impor- ance to the user. Whenever the ie goes back to the tool room or repair, quick change is most ecessary in order to maintain teady high production rates.

Clearance Determined—Data pre- ented in Table I have been tried nd proven correct in the blanking f magnesium, chrome nickel steel, opper, brass, soft steel, chrome teel, aluminum, medium steel, tainless steel, hard bronze, mica nd hard silicon steels. Values hown are not angular clearances ut the amount a punch must be maller than the hole in the die. his clearance, of course, depends n both thickness and temper of the stock being punched. The harder the material, the greater the allowance which must be made.

Many die designers and die- makers are somewhat vague when questioned about proper die clear- ances. Some of them assert that they make the punches to fit the dies with no allowances. Un- doubtedly this is a primary cause of many die failures, breakages, etc. Both minimum and maximum clearances are shown in Table I, but it is best procedure to begin with minimum clearance. This is true only in blanking the softer metals. If this is not satisfactory, then it is well to increase the value but never above the maximum clearance.

Added Benefits — After many years of experience in blanking, piercing, trimming and shaving, the author has personally estab- lished the clearances as shown in the table. Dies made of tungsten carbide can be fabricated with 1 to 2 per cent more clearance than those made of high-carbon high- chrome steel—mainly because the material holds a cutting edge long- er.

The correct radial clearance can help provide one or more of the following benefits:

1. Clean cutting, with minimum irregularities and surface fis- sures.
2. Minimum taper along the fractured edge.
3. Maximum area of sheared edge being perpendicular to flat top-and-bottom work sur- faces.

TABLE I

Minimum And Maximum Clearances Between Punches And Dies For Different Thicknesses Of Stock And Hardnesses Of Material Clearance in Inches

Stock Thickness	Soft		Medium		Hard	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
0.004	0.0002	0.0003	0.0003	0.0004	0.0004	0.0006
0.007	0.0003	0.0004	0.0005	0.0007	0.0008	0.001
0.010	0.0004	0.0005	0.0007	0.0009	0.001	0.0013
0.014	0.0006	0.0008	0.001	0.0012	0.0014	0.0018
0.018	0.0009	0.0011	0.0013	0.0016	0.0018	0.0022
0.022	0.0011	0.0013	0.0016	0.0019	0.0022	0.0025
0.025	0.0013	0.0016	0.0019	0.0022	0.0025	0.0029
0.030	0.0016	0.0019	0.0022	0.0026	0.003	0.0034
0.040	0.002	0.0025	0.0028	0.0032	0.0036	0.004
0.050	0.0025	0.003	0.0032	0.0036	0.004	0.005
0.060	0.003	0.0035	0.0037	0.0041	0.0044	0.006
0.070	0.0035	0.004	0.0041	0.0045	0.0048	0.007
0.080	0.004	0.0045	0.0045	0.005	0.005	0.008
0.090	0.0045	0.005	0.005	0.0055	0.0054	0.009
0.100	0.005	0.0055	0.0055	0.006	0.006	0.010

TABLE II

COMPARATIVE ANALYSIS BETWEEN LAMINATION DIES BUILT OF CARBIDE VERSUS STEEL. Material stamped was 4% silicon—transformer grade. Dies produced two "E" and two "I" blanks per press stroke.

	Carbide Die	Steel Die
Die cost	$6,800.00	$4,200.00
Expected die life (Scrap at 0.200-inch)	1.050-inch	1.050-inch
Srokes per hour	11,000	6,000
Pieces per grind	1,000,000 of each	115,000 of each
Total number of grinds	150	105
Average amount of material removed per grind	Punch 0.010-inch Die 0.007-inch	Punch 0.012-inch Die 0.010-inch
Blanks per 0.001-inch of die life	143,000 of each	11,500 of each
Total production from die	150,000,000 "E" blanks 150,000,000 "I" blanks	12,000,000 "E" blanks 12,000,000 "I" blanks
Total press strokes	75,000,000	6,000,000

TABLE III

Comparison Of Carbide Blanking Grades

Kenna-metal	Allegheny Ludlum	Firth Sterling	Carboloy	Percentage of Cobalt	Rockwell "A"	Rockwell "C"
K-90	———	DC-4	190	25	85	67
K-91	CA-20	DC-3	——	20	86.5	70
K-92	CA-11	DC-X	55-B	15-16	87.5	71.5
K-94	CA-10	DC-2	55-A	12-13	90	76
K-95	CA-12	——	779	9	90.5	77
K-96	CA-4	DC-1	883	6	92	80

The above chart lists the standard grades of Kennametal in comparison with competitive grades with which they are equivalent in cobalt only. The information listed above is approximate and instructions regarding their use should be obtained from the manufacturer.

4. Minimum burr height.
5. Minimum press exertion.
6. Maximum tool life.

In actual practice, it is often necessary to sacrifice benefits 1, 2, 3 and 4 to a degree in order to gain benefits 5 and 6.

Costs Down — Cost of carbide dies has taken a tremendous drop during the last fifteen years. On an average, carbide dies today cost 50 to 100 per cent over dies made of steel. Five years ago carbide was 300 to 400 per cent over steel die cost. There are some today that cost more made with steel than with carbide.

To illustrate this case a good example is the grinding of small diameter punches and bushings to close tolerances. Stock removal in a bushing with a 0.030-inch diameter hole in steel would be difficult because of the necessity of removing 0.006 to 0.009-inch of scale. In carbide the bushing merely has to clean up.

Another example is the grinding of 0.022-inch thick carbide to plus or minus 0.0001-inch tolerance, and holding it parallel. It is more difficult to grind high-carbon high-chrome steel of 62-63 Rockwell-C to those tolerances than carbide. More know-how, better equipment and a general breakdown of "people who naturally resist change" has brought tungsten-carbide into the forefront of the die field.

Super Surface — Grinding of carbide for blanking dies is steadily being performed all over the country. From actual experience in the field, a few words of caution should be heeded. Carbide can be fractured and sometimes not detected until in actual use by using vitrified-bond diamond wheels or by grinding with silicon carbide wheels. Both of these methods are not generally recommended in grinding carbide for blanking dies. Resinoid bonded diamond wheels are recommended for roughing and finishing. Wheel backing should be of Bakelite material and not of aluminum or any other metallic material which more easily retains heat generated in the cutting action.

Grinding carbide with any type coolant is highly recommended especially to keep the wheel free cutting and cooler while maintaining longer wheel life. Best development during the last few years has been lapping or grinding the die surface to 1-1½ microinch finish.

This has enabled an increased production at one of our leading manufacturers of 30 to 40 per cent since the new lapping technique was introduced. Conventional grinding of the die surface affords between a 10 to 15 microinch finish.

Changes in Operation — Press working carbide dies have made many changes in press structure and design. Carbide dies substantially increase production if they are run to 180 strokes per minute or faster. Naturally long leads and faulty feeding tend to discredit this. Blanking with an oil mist system which can be easily incorporated into the stripper has materially improved stripping action.

Avoid use of sulphur base oils in this mist system. Sulphur is an "opponent" of cobalt—the binder material in sintered tungsten carbide. Limit switches (micro switches) are being used more and more in conjunction with air-clutches. With a limit switch connected to a spring pilot and in turn connected to the air clutch, the press can be stopped immediately upon the occurrence of a mis-feed.

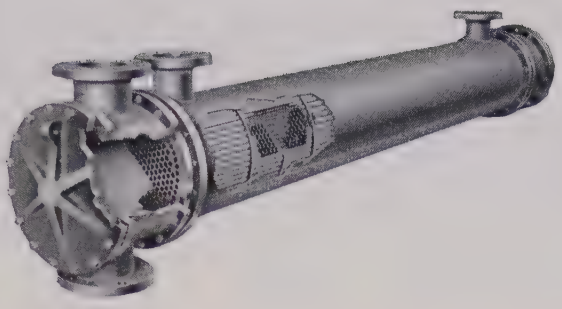
Increased 300% — Future of tungsten carbide in the die field appears extremely bright because of the faith shown by progressive American manufacturers who are now using carbide for blanking as well as for drawing, heading, swaging, compacting, coining and other operations.

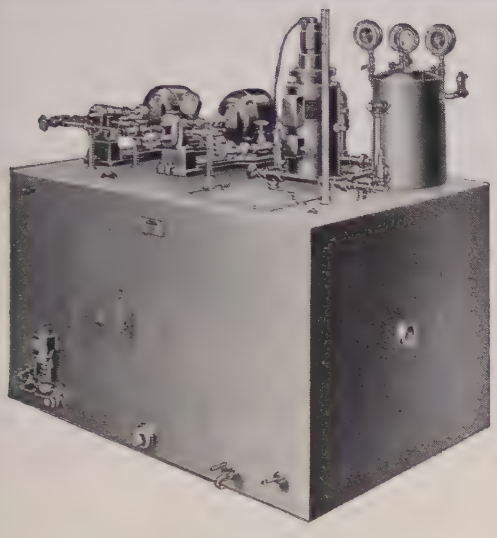
All this has forced larger carbide manufacturers to expand their facilities three-fold during the last four years.

However, there is no reason for limiting use of carbide to dies only. Forward looking manufacturers are daily finding new uses for carbides. Use for sizing punches, curling of hardware, wear parts, and riveting are some impressive recent applications. Industry has been forced to use tungsten carbide due to demand for stepped-up production which is necessary to enable their continued operation in today's highly competitive market.

This carbide notching die is used in an indexing press to produce steel laminations for rotor and stator par

ROSS EXCHANGERS





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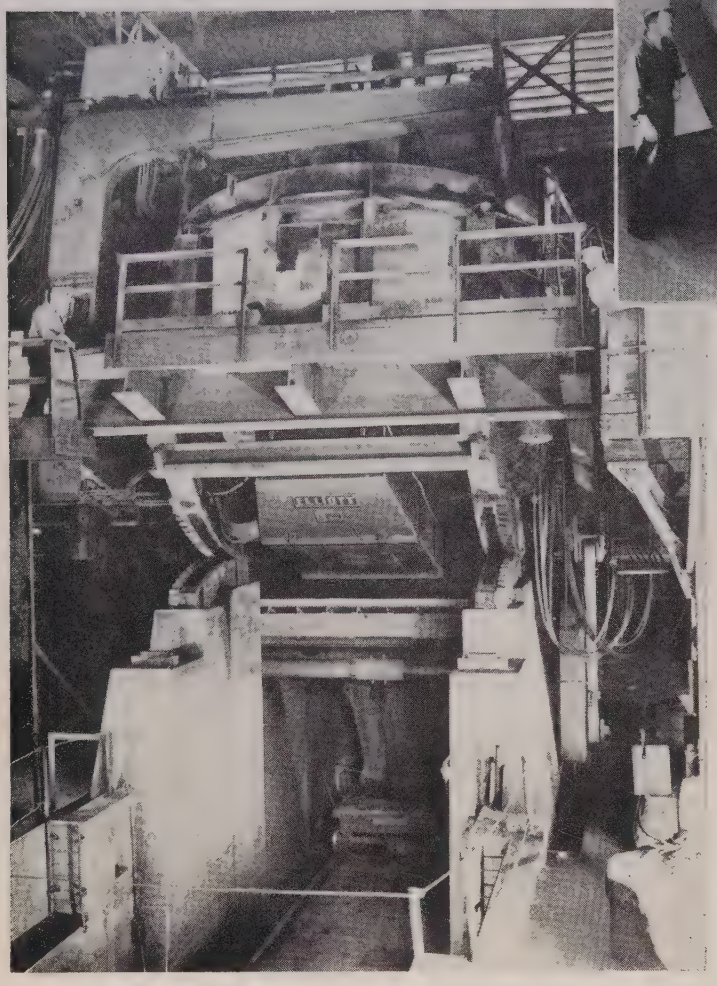


Fig. 1—New electric furnace, Timken Roller Bearing Co., Canton, O., showing the induction stirrer fastened to the bottom. Furnace has been tilted to deslagging position

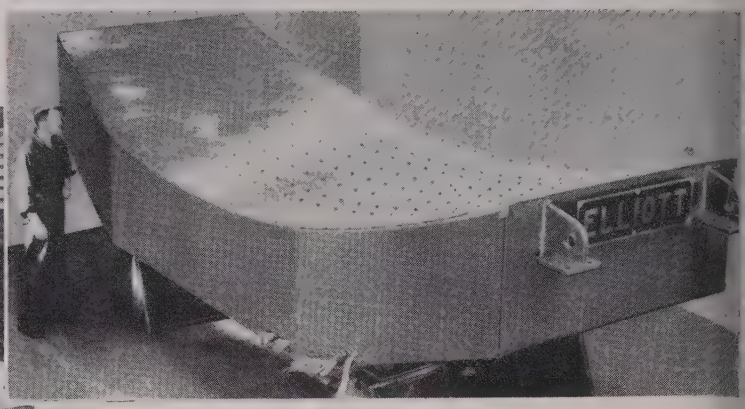


Fig. 2—In the above picture is a shop view of the stirrer showing relative size and contour

Induction Stirrer Improves Quality of Steel

Use of low frequency power results in suitable speed of magnetic field over surface of bath and its deep penetration into molten metal in furnace

By ERIC G. MALMLOW and QUENTIN GRAHAM
President, Aros Electric Co. New York
Vice President, Elliott Co. Ridgway, Pa.

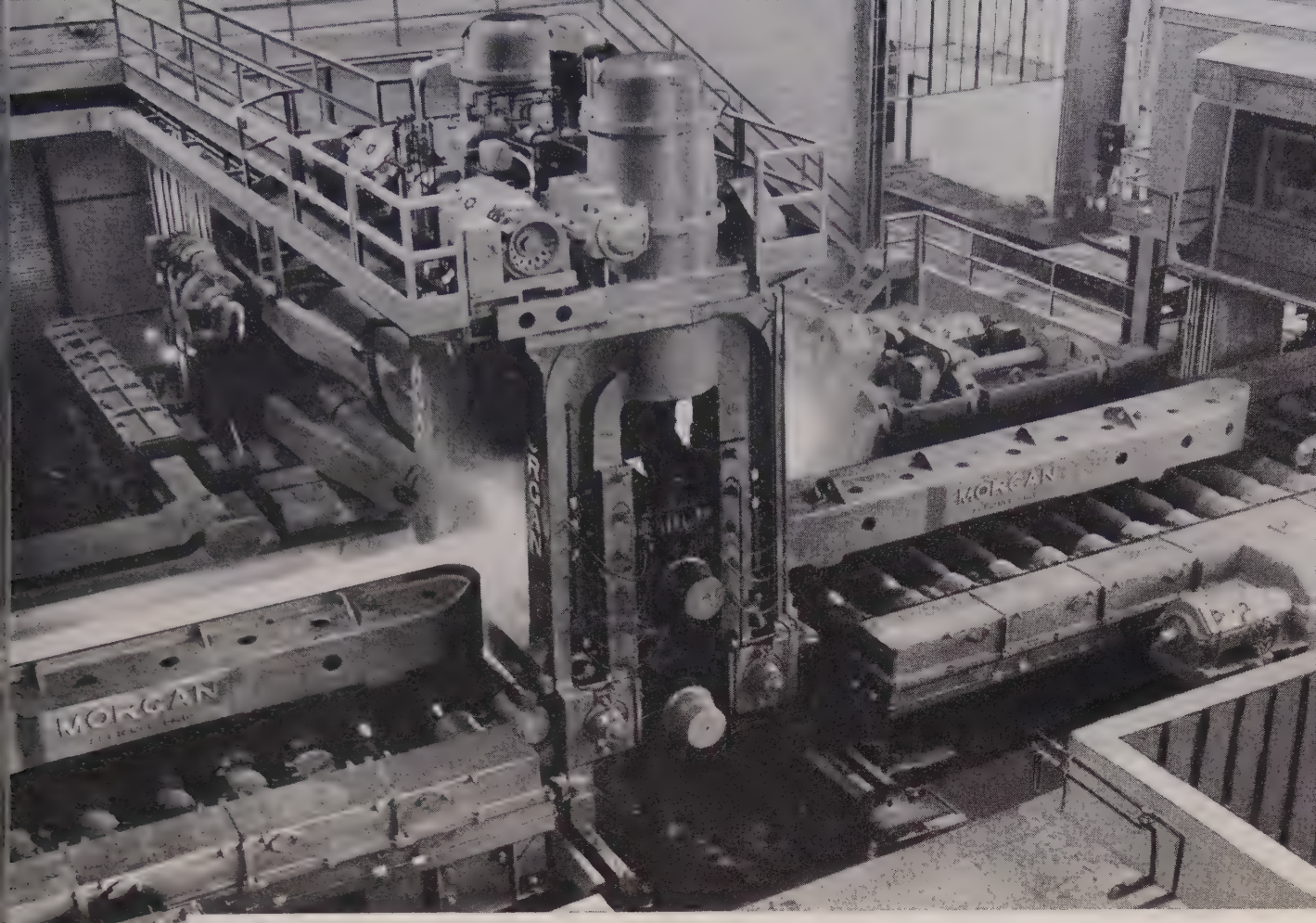
RECENT installation at Timken Roller Bearing Co., Canton, O., of a 100-ton electric arc furnace equipped with an induction stirrer (Fig. 1) marks the beginning of a new era in electric-furnace steelmaking in this country. The principles of stirring the molten metal by inductive means has been established abroad as being sound economically. In Swedish installations marked improvements have been noted in overall production time, and in the quality and uniformity of the steel.

The metallurgical benefits of early installations have been described[1, 2]. Briefly the principle benefits are as follows:

1. A saving in time required per melt, largely because of faster reactions between steel and slag.
2. A much easier slagging-off operation.
3. A more uniform temperature in all parts of the mass and a more rapid distributing of alloying elements, thereby making certain that samples are more nearly representative of the entire melt.
4. Uniformity of finished product with its cleanness and closer tolerance to specifications.

The stirrer was invented and developed by ASEA, the largest electrical manufacturing works in Sweden, under the guidance of Dr. L. Dreyfus. The first installation of this type of stirrer was at the Surahammar steelworks in Sweden in 1939. The second was at the Hagfors Works in 1947. The first Surahammar stirrer confirmed the principle, but had operating difficulties which required its being removed from service. In 1948, a second stirrer was installed at Surahammar and is still operating successfully. Several additional stirrers have since been ordered for other European steel plants and some are already in operation.

Installs Initial Unit—During the latter part of 1950 an agreement to manufacture the stirrers in this country was made between Aros Electric Inc., New York, and the Elliot Co. Aros Electric Inc., is



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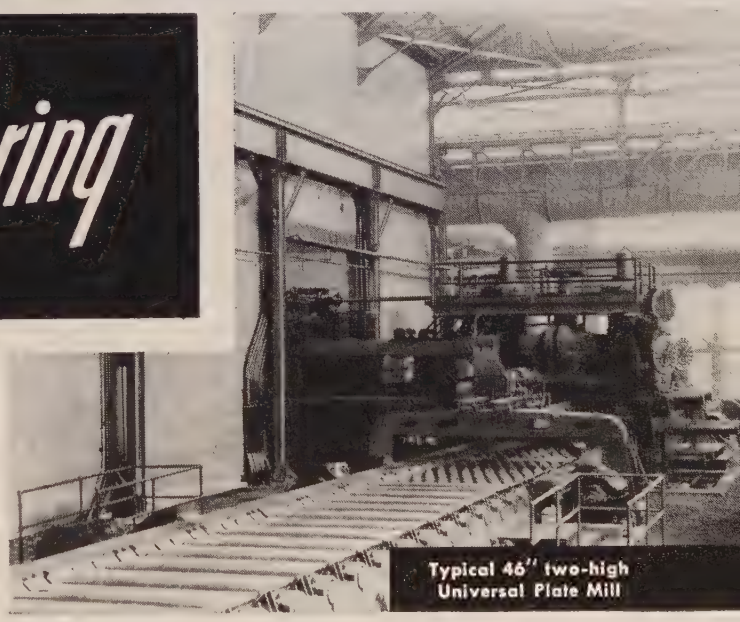

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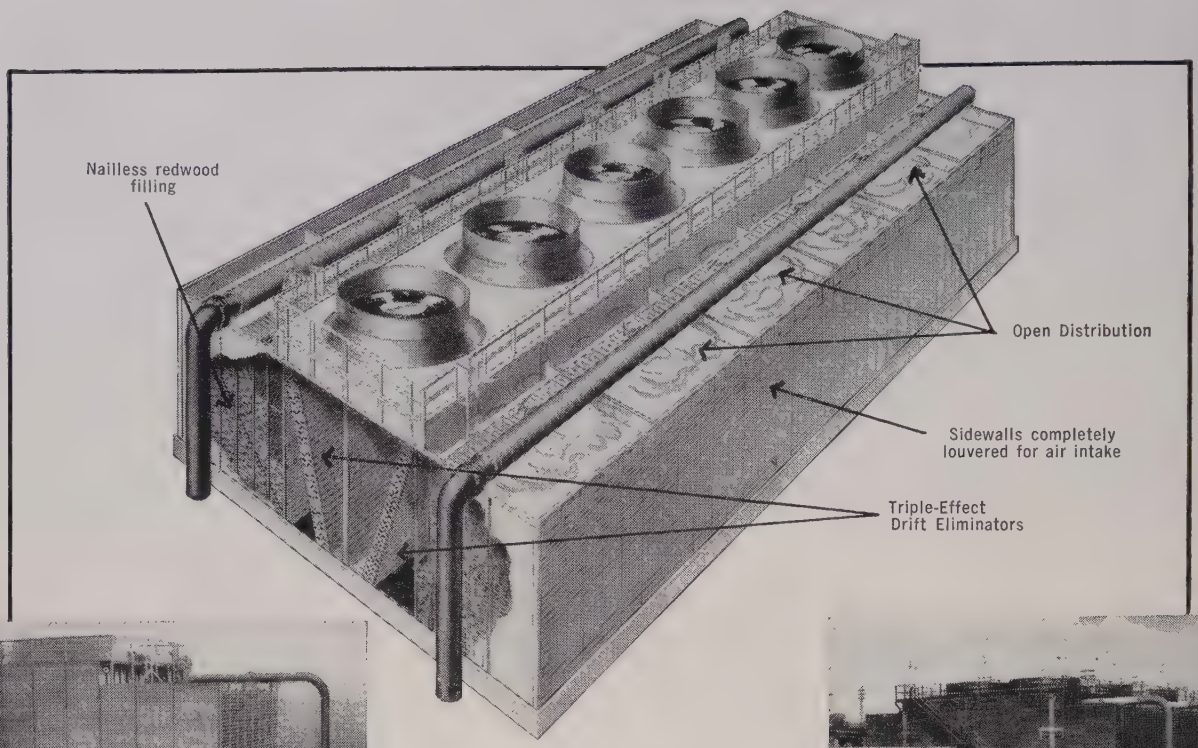
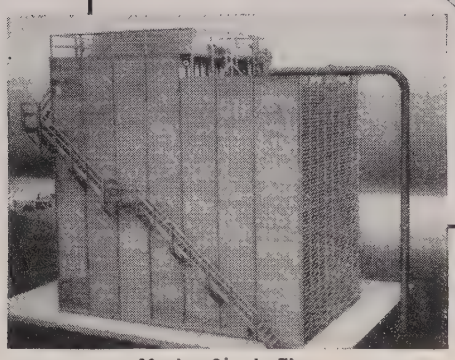
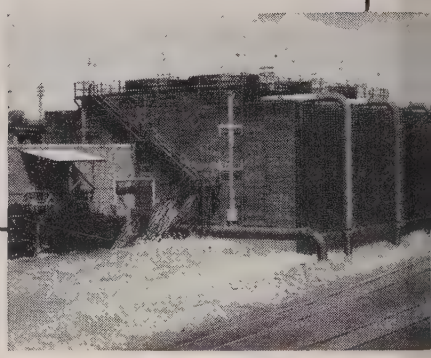


Marley Double-Flow *



Marley Single-Flow *



Marley Twin-Flow *

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AIR INTAKE through completely louvered side walls. This makes for greater air volume per fan and the air circulates at uniform velocity throughout the tower. Only by this method can the filling be arranged in the tower with least interference to air flow and to retain the water for a longer period of time and achieve a more efficient water-air contact.

MECHANICAL EQUIPMENT is designed and manufactured by Marley exclusively for its cooling towers. No commercial equipment is used. Each part is specifically designed for long wear under tough operating conditions.

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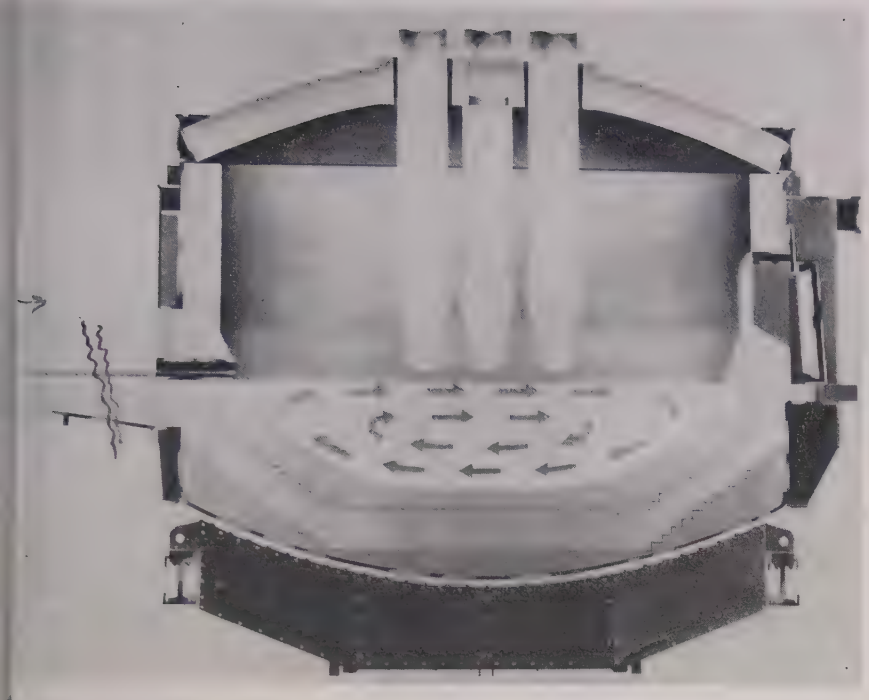


. 3—Cross-section of the stirrer mounted on the bottom of the furnace. rring action can be directed as shown to facilitate slag removal, or in posite direction during normal operation by reversing the magnetic field

wholly owned subsidiary of SEA and the induction stirrer being marketed through this or- nization. The present stirrer at mken is the first to be installed this country. It was built at e Ridgway Division of the Elliott .

The stirrer, shown in Fig. 2, is scribed as a segment of the ıtor of a gigantic induction mo- r. It is wound for 2-phase sup- y and consists of two magnetic les. The power supply is of low equency so the magnetic field avels over the surface at the ost suitable speed and penetrates ll into the molten metal in the rnace.

In the 20-foot diameter Heroult rnace, built by the American idge Division, United States eel Corp., Pittsburgh, the bottom spherical with 1¼-inch bottom ıte of stainless steel, which is ected for its nonmagnetic char- teristics.

Stirrer conforms to the bottom the furnace and is bolted to the ckers so that it moves with the rnace as it is tilted.

Because of the extremely low quency with the corresponding- low core loss, it was not neces- y to use thin laminations for e magnetic circuit of the stirrer. Actually, the core is made from ¾-inch carbon steel plates, bolted together, while the teeth are made from angle iron welded to the core. The conductors are formed from a hollow rectangular copper section, and each coil consists of several turns wound in pancake fashion and carefully formed to the required curvature.

Cooling of the stirrer winding is effected by circulating distilled water through the hollow copper conductors, and thence through a water-to-water heat exchanger in a closed system. The coils of each phase of the 2-phase winding are all in series, electrically, but they are in parallel with respect to the cooling water circuit so as to decrease the pressure drop to a reasonable value. This necessitates the use of a hose connection at each coil end and adjusting valves to balance the water flow.

Unit Well Protected—The winding is insulated with full class B insulation and is well braced to withstand the magnetic forces occurring in the end windings. Brass plates cover the inner surface of the stator as a protection to the slot portion of the coils, while stainless steel covers protect the end windings.

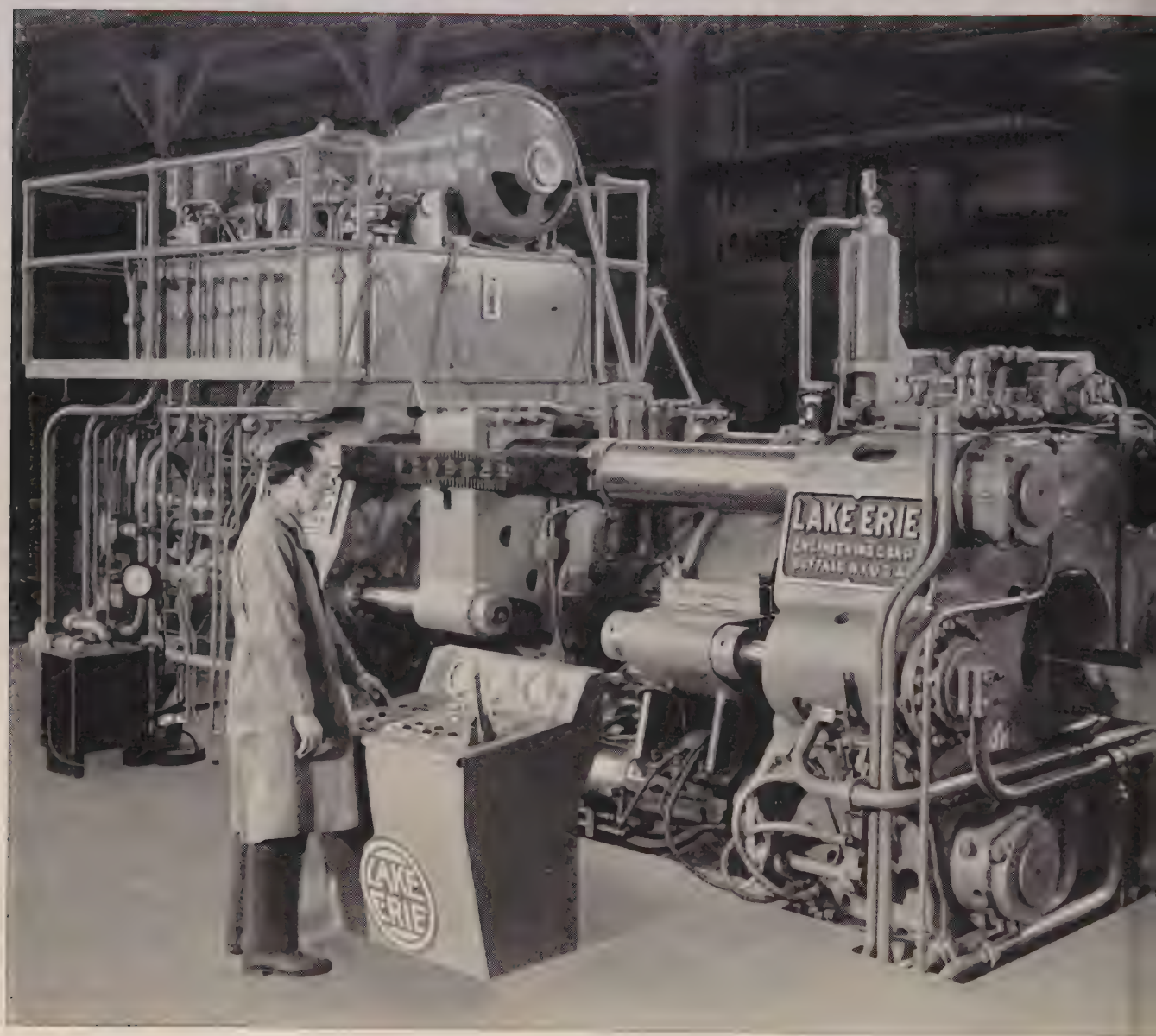
It is interesting to compare this device with the familiar induction motor. The distances from the "stator" surface to the molten metal, which becomes the "rotor," is about 30 inches. Thus, we are dealing with a segment of a motor which has a 30-inch air gap. It is easy to understand why the power factor of the stirrer is not particularly high, being less than 50 per cent.

Currents induced in the molten metal, reacting with the magnetic field, set up mechanical forces which stir the entire mass, as seen in Fig. 3. The theory of this action and an explanation of why this principle of stirring has advantages over all other possible methods has been covered[3]. It may be pointed out that reversal of the direction of stirring, which is sometimes an advantage, may be accomplished easily by a reversal of the phase sequence in the generator.

Power for the stirrer is supplied by a 485 kva, 2-phase, 230-volt generator, driven by a synchronous motor. The generator is a commutator-type machine which obtains its excitation from a low-frequency commutator-type frequency-changer. The latter is a self-driven machine, which converts from 3-phase, 60-cycle power at its slip rings to 2-phase current of low frequency at its commutator, and furnishes sufficient power to excite the 2-phase field winding of the main generator. The frequency-changer exciter was built by ASEA, while the main generator, following ASEA ideas, was completely designed and built by the Elliott Co. at its Ridgway Division. The synchronous motor driving the special low-frequency generator is a conventional 3-phase, 60-cycle machine, having an 80 per cent leading power factor rating. To assure freedom from operating troubles caused by air-borne dirt, the motor-generator set has a closed ventilating system with an air-to-water heat exchanger.

The stirrer equipment is centrally operated from a control cubicle mounted adjacent to the furnace control panel. The control equipment includes a station for measuring, in 20 sections, the temperature of the furnace bottom above the stirrer, and an ASEA

BIGGEST NEWS OF THE



THE 1250 TON LAKE ERIE extrusion press has a self-contained pumping unit and electrically heated container. Elimination of the gate lock and die runout table make this design far more compact and rigid. New swinging die arm illustrated on opposite page takes their place.

7 MAJOR FEATURES REVEALED

1. New swinging die arm eliminates gate lock and die runout table... speeds die changing...greatly reduces maintenance.
2. Shorter stroke increases speed and decreases maintenance.
3. Container supported on center-line of press prevents changes due to heat expansion.
4. Loader for billets and dummy blocks simplified.
5. Special control permits exact speed adjustment to suit the work.
6. Interlocks prevent accidents.
7. More compact design saves large floor area...increases rigidity of press.

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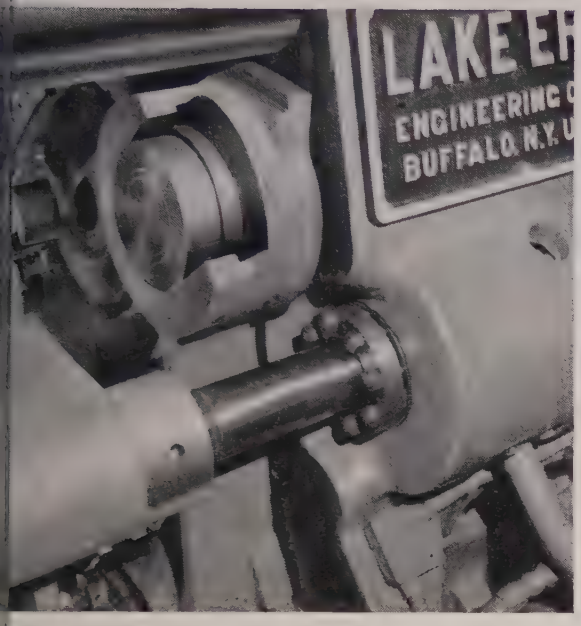
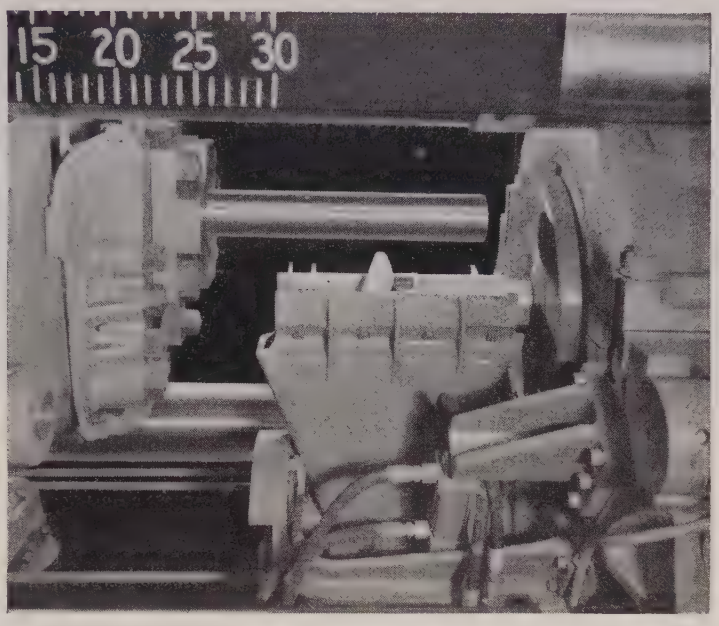


W SHOWING the swinging die arm which pivots
it one of the lower columns. "Horseshoe" cavity
op of swinging die arm carries the die holder with
die and separate backup block.



THE BILLET LOADER is of simple, unique construction consisting of a V-block mounted on an arm pivoted on the vertical centerline of the press. The extrusion stem is mounted on a vertical slide.

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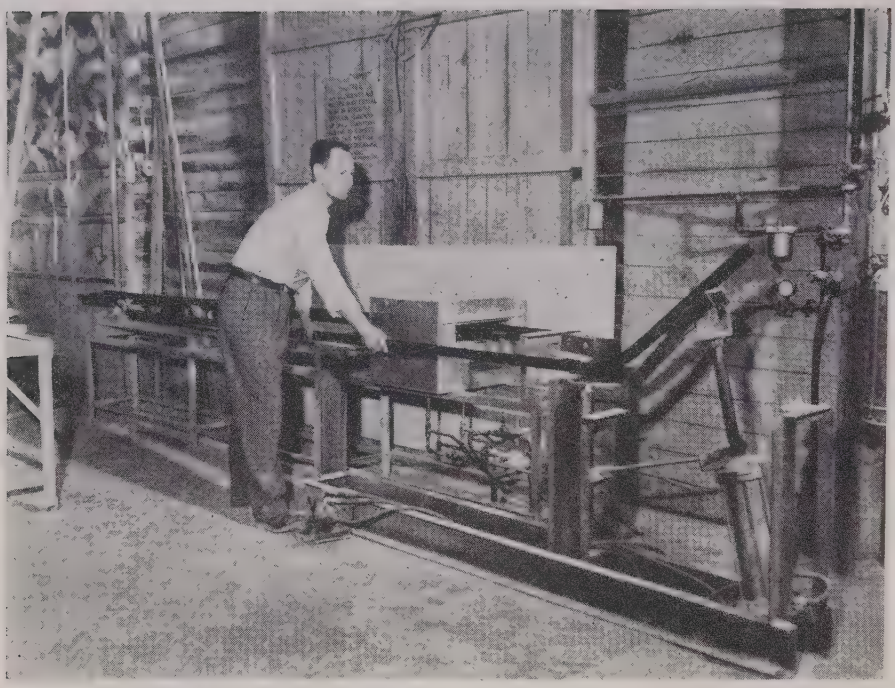

Special Bender for Glass-Lined Pipe

Fourth piece of special equipment for production of glass-lined steel pipe has been installed by Barrows Porcelain Enamel Co., Cincinnati. The air-operated hydraulic machine bends a length of flux pipe to 45 degrees after it is coated inside and out. In addition to its bending apparatus, the company has designed and made a special dipping unit, drying drum and pipe fusing furnace

alarm system that will instantly warn the operators if abnormal temperatures should develop at any one of the measuring points.

Considerable interest in the Timken company's stirrer is being shown among those responsible for the production of quality electric-furnace steel. This initial American installation establishes the ASEA induction stirrer as a new tool at the service of the U. S. steel industry.

BIBLIOGRAPHY

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[2] "Inductive Stirring in Arc Furnaces," by S. Fornander and F. Nilsson, *Journal of Metals*, vol. 188, Jan. and Feb. 1950.

[3] "An Induction Stirrer for Arc Furnaces," by L. Dreyfus, ASEA *Journal*, vol. 23, 1950.

Secondary Batter Reduced

Railroad track crews usually build up driver burns at the same time rail ends are repaired, using the same welding rod for both purposes. In many cases, however, the built-up burn will cold-roll into a hardness greater than the surrounding area, producing an undesirable secondary battery from train wheels.

To meet this problem, Oxweld Railroad Service Co., a division of Union Carbide & Carbon Corp., New York, developed a welding rod specifically for use in building up driver burns. The rod deposits weld metal in equal hardness to rail steel. Therefore, the division reports, the metal wears at the same rate as the base rail steel and sharply reduces possibility of secondary batter.

Asbestos Insulation Summary

"Quinterra-Quinorgo" is the title of a 32-page publication issued by Johns Manville to give complete information about these electrical insulations made of purified asbestos. It reports why they were developed, their characteristics and suggests where they may be used to advantage.

The publication is planned both as a manual of facts and as a descriptive brochure. For the electrical equipment designer, tables provide test data on physical and electrical properties. Test methods are explained fully and a separate table shows each of the several insulation types.

The production man gets advice on application techniques and equipment, including step-by-step photographic coverage of current methods. These pictorials also i lustrate improvements in finish products, including space saving lower weight, materials econon and service life. Copies are ava able from the company, 22 E. 40 St., New York.

Simplified Connector Splice

To help industrial truck batte users extend battery life with i proved repair and maintenance pr grams, Gould-National Batteri Inc., Trenton, N. J., has develop a simple mold with which conne tors can be spliced directly on t job. After the intercell connecto have been sawed, battery elemen removed for repair and repair cell replaced in its rubber jar, t splicing mold permits simple reco struction of the sawed connect in its original form.

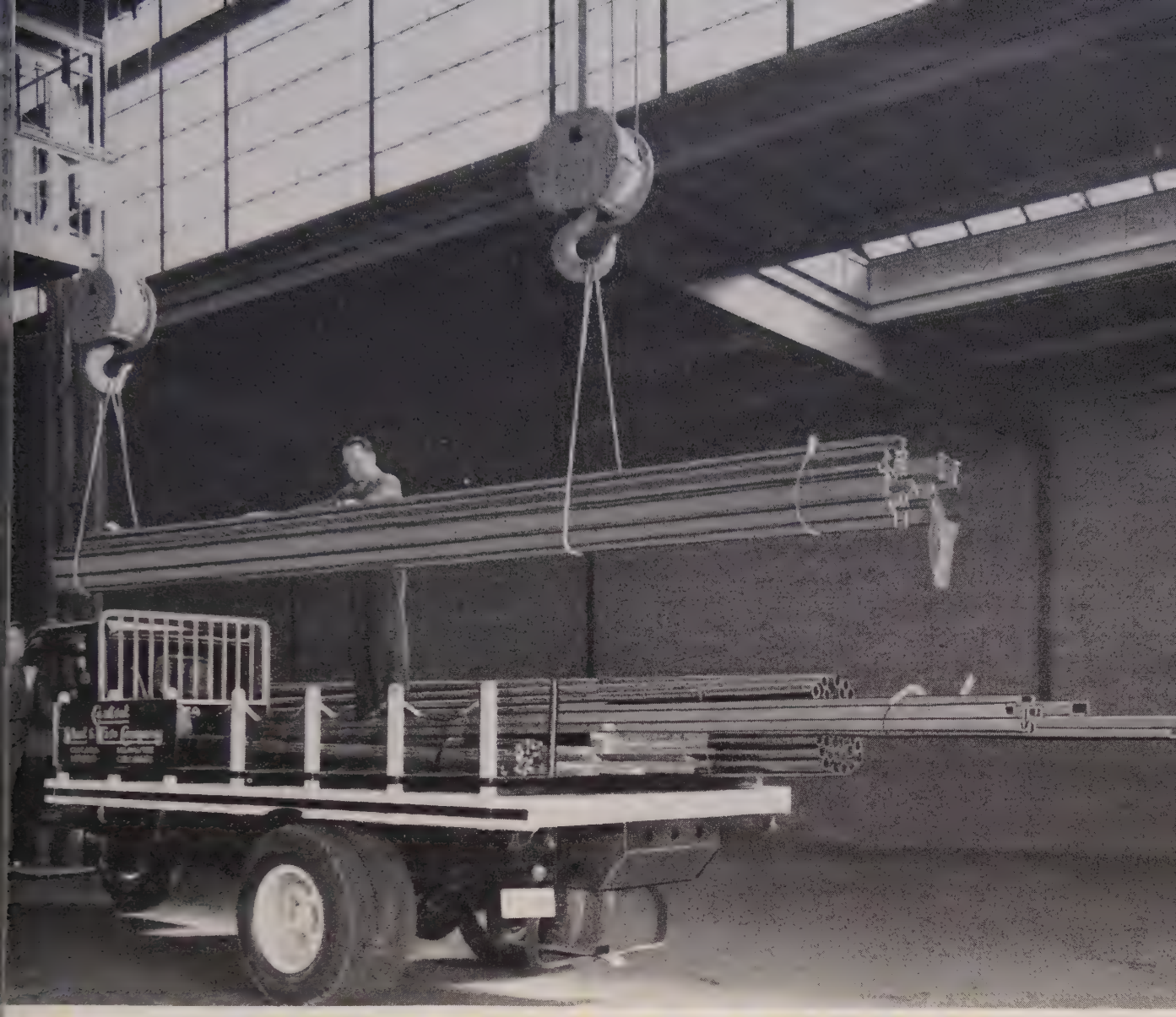
The mold consists of a simp plate with two side blocks—o fixed, the other movable. Befo it is placed under the connector be spliced, the two sawed ends the connector are chamfered provide puddling space. The mold then supported from both sides b small wedges. Movable mold bloc is next brought into contact wit the connector. It is then possib to use the lead-burning electro to make the weld in the exact sha and form of the original connecto

The tip of the carbon electrode touched to that side of the conne tor which is in the electrical circu and held in that position until it cherry red. Lead is then add and carbon electrode tip mov slowly through the puddle of mo ten lead to build the weld from t bottom up.

Aluminum Shapes Cataloged

Catalog covering about 40 standard extruded aluminu shapes, rod, bar and tubing c hand without additional die servi charge is available from Precisio Extrusions, Bensenville, Ill.

Valuable to designers and eng neers is a chart compilation ind cating physical properties and re ommended applications for the most generally used alloys. A loys are listed by number, mak up and uses; alloying element temper; least thickness to worked; tensile strength; and pe centage of elongation.



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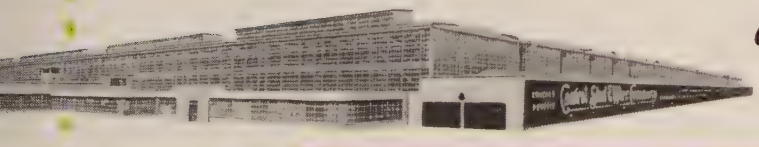

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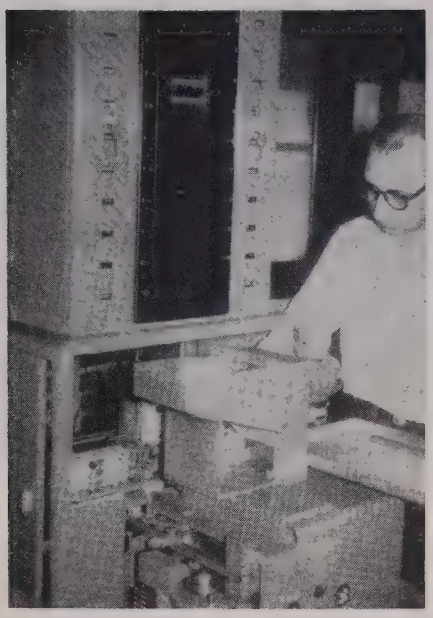
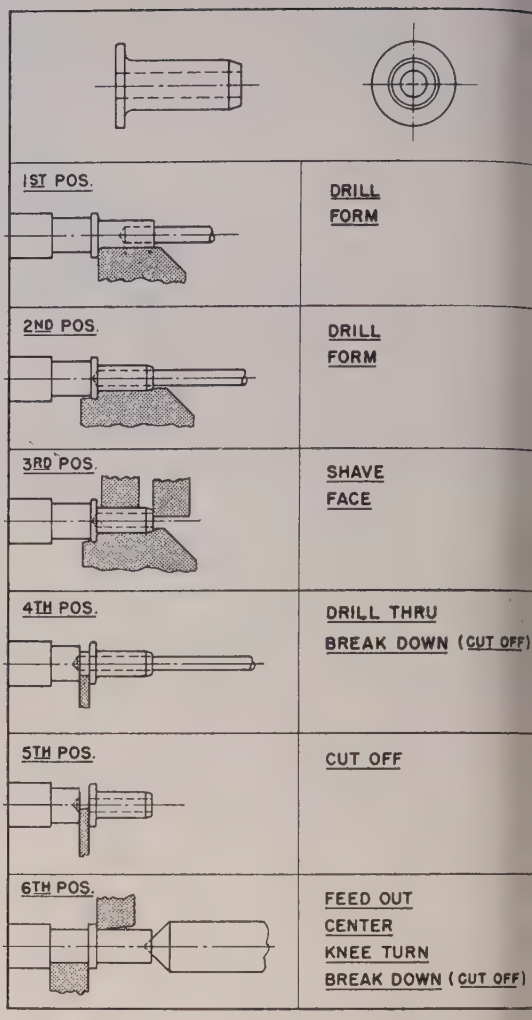


Hopper feeds small plunger supports into the automatic gaging machine. Columns of lights to right and left of part drawing on the panel indicate status of part just gaged. Columns of counters keep running tab on how many parts have fallen into each group and tell which dimension is off



Layout sheet shows how the part progress through six-spindle National Acme automa

High-Speed Gaging Clears Bottleneck

When hand gaging slowed down production, a screw-machine-products company added an automatic machine which gages faster than parts are machined

BIG PROBLEM in the mass production of small parts is that of making all secondary operations keep up with today's high-output machines.

Plunger supports for fuse bodies come off the six-spindle automatics at a rapid clip in the plant of Couch-Uthe Co., Elyria, O. Cycle time is 6 seconds per piece. At 70 per cent efficiency that's 420 parts per hour per machine and they have four machines on the job.

Bottleneck—Big holdup on this job formerly was the gaging operation. The parts are about 0.610-inch long and 0.413-inch in diameter. A flange at one end, chamfer at the other and a hole drilled through add to the complexity of the inspection.

Hand inspection of the over-all length alone had a peak rate of about 2000 parts per hour. Hand inspection of all seven critical dimensions caused the rate to drop to 400 pieces per hour, far below the output of the four machines.

Shifts Load—Installation of a Sigma automatic multidimensional inspection machine, however, has put the burden back in the machining department. This machine now automatically inspects the seven dimensions automatically at the rate of 2900 per hour, and the human element is eliminated.

Both ends of the hole and both ends of the turned diameter are checked to prevent taper. Other checks are made on over-all length, width and diameter of flange.

Easy Shift — When a slight change in tolerances or sizes occurs the operator can adjust the machine by turning calibrated dials for each gaging step. In the event the machine is to be run on several different jobs the gagi units can be slipped out and ne ones put in their place.

Machine also does an automat sorting job. It ejects parts in one of three slots. First is t accepted slot where all dimensio have checked within limits. Se ond is the reject category whi throws out parts which will scrap.

Salvage—Third slot is for tho parts which don't meet requir tolerances but which can be r paired. In this case whenever dimension is not as specified b there is sufficient stock for a r machining operation, the parts a later brought down to with limits.

Made from FS 1137 steel, t parts are all zinc plated and chromate dipped before packi and shipping.

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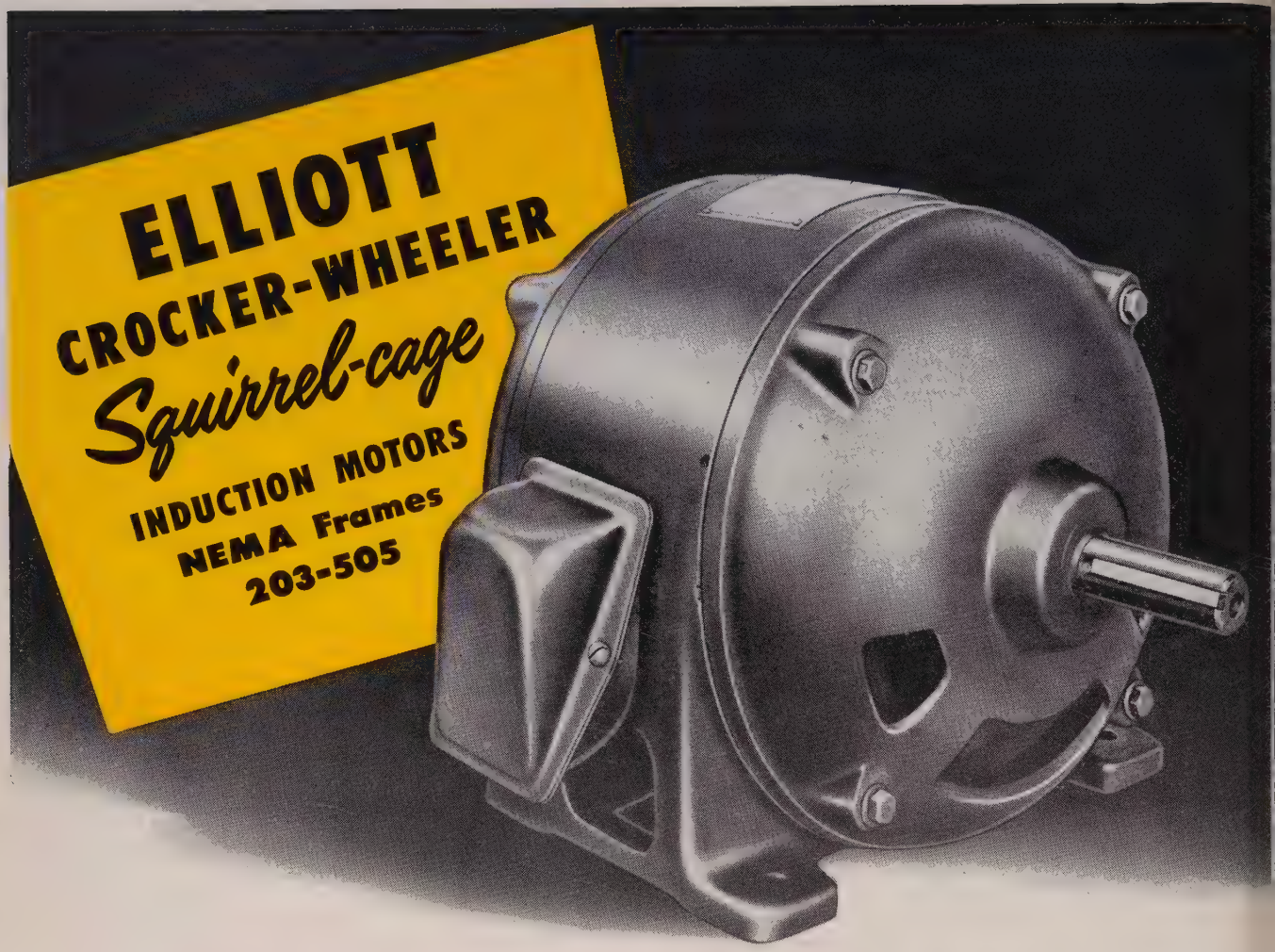

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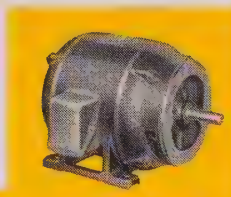
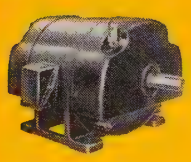


Horizontal C face mounting, frame with feet.



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w Light Shed on Metals

se of polarized light to inves- gate crystal orientation is suc- ssful

OWLEDGE of the orientation crystals of metals is often of tical importance, but no gener- satisfactory method has been llable for determining the orien- on of the small crystals found ommercial metals. Because of need for such a method, the Na- al Bureau of Standards is inves- ting the possibility of estimat- crystal orientation from meas- ments of changes in the charac- stics of polarized light.

he work is being conducted by Bureau's mechanical metal- y laboratory. Results so far cate that, in the case of the ustrially important alloy of 70 kel and 30 copper (Monel), crys- orientation can be correlated h extinctions of polarized light.

roperties Differ — Commercial als are composed of aggregates small crystals or grains. The gnitude of many important prop- es—such as strength, elasticity, magnetism—differs in different ctions in these small crystals. some specimens of some metals orientations of the individual stals do not follow a random ribution; instead, a "preferred ntation" predominates, and the rall properties of the metal vary h direction. Also, the orienta- ns of adjacent crystals influence ir interactions when the aggre- e is subjected to strain, heat, or rosive environment.

X-ray diffraction methods of de- mining crystal orientation have n attempted, but cannot be ap- d conveniently to small crystals. e metallurgical microscope is venient for observing small stals, but its use is generally ited to showing differences in ntation qualitatively.

Use Polarized Light—In recent rs, these microscopes have been ipped so that the specimen can illuminated with plane-polarized ht. When a metallographically ished and optically active sur- e is examined with such an ar- gement, characteristics of re- ted polarized light change meas- bly from crystal to crystal.

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In the commercial metallographi microscope used for the NBS study the analyzer is fixed in the crossed position with respect to the polar izer, and the light irradiates the polished surface of the specimen a normal incidence. Under these conditions, when an optically aniso tropic surface is rotated 360 de grees around the axis of the inci dent beam, four minima (extinc tions) and four maxima will alter nately appear in the intensity o the reflected light.

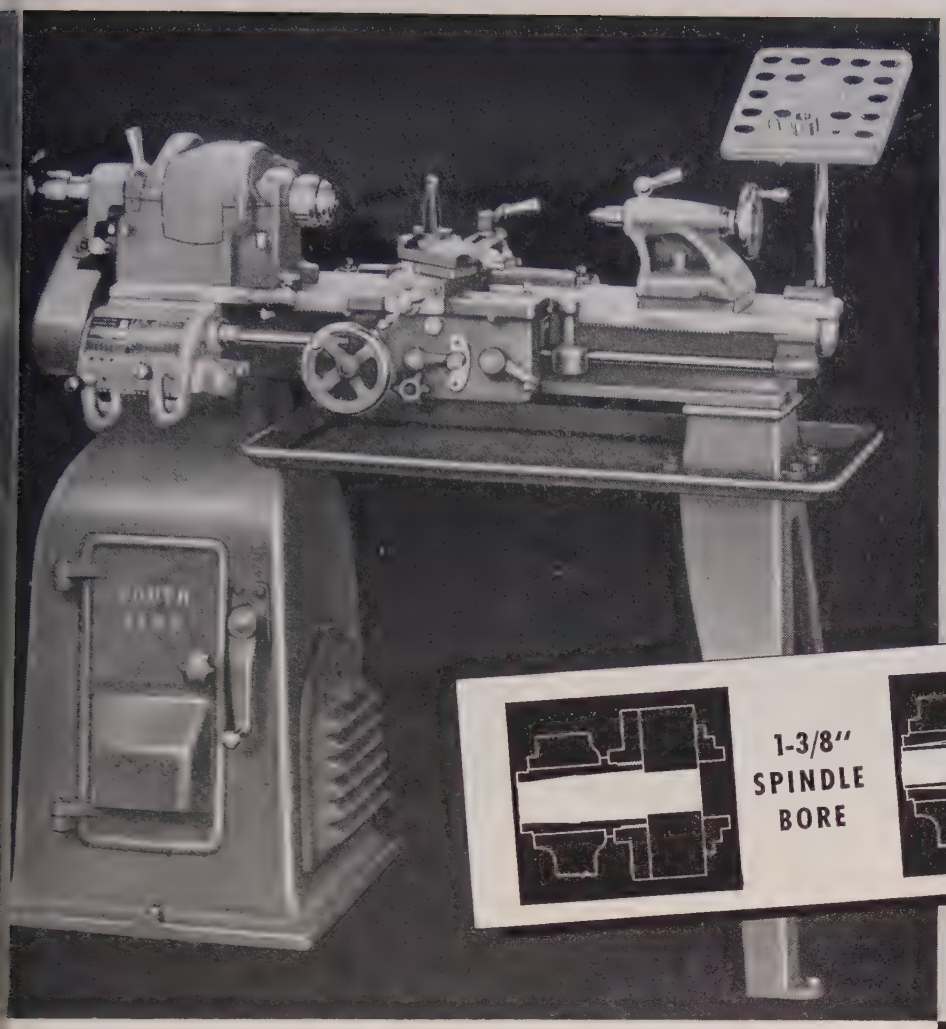
Surfaces Etched—Although met als having a cubic crystal structure are not inherently optically aniso tropic, the surfaces of many such metals—including Monel—become optically anisotropic after etching with conventional metallographic reagents. The angular positions o the polarized-light extinctions o Monel differ for adjacent crystals and it was found that these posi tions remained the same after re polishing and re-etching. It seemed to follow that the apparent optical anisotropy, being thus independent of the etching treatment, could probably be correlated with crystal orientation.

Examination of annealed Mone specimens showed clusters of crys tals in which each crystal was ad jacent to at least one annealing twin. It was also observed tha some of the clusters contained a crystal whose straight-line boun daries were in four different direc tions. This made it possible to de termine the orientation of tha crystal from geometry and a knowl edge of the angular relationship of the twinning planes and the co ordinate axes of the crystal.

Fluid Power Group Organizes

Organization session for repre sentatives of firms designing and manufacturing hydraulic pumps hydraulic and pneumatic cylinder and control valves is scheduled May 18-19 at Bedford Springs hotel Bedford, Pa. On the agenda i adoption of a constitution, election of officers and directors and am plification of the new association' objectives.

Adopting the name Nationa Fluid Power Association, the grou has established offices at 1618 Or rington Ave., Evanston, Ill.



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SWING 10⅛" over bed and saddle wings, 5¾" over cross slide.
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BED LENGTHS 3, 3½, 4, 4½ ft.
CENTER DISTANCES . . . 14¾ to 34¾ inches.
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POWER CROSS-FEEDS 48 . . . .0006" to .0309"
THREAD CUTTING 48 R.H. or L.H. pitches, 4 to 224 per inch.
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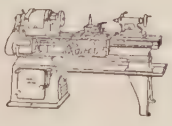

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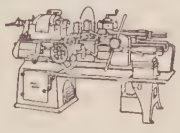

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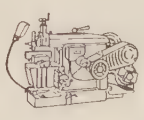

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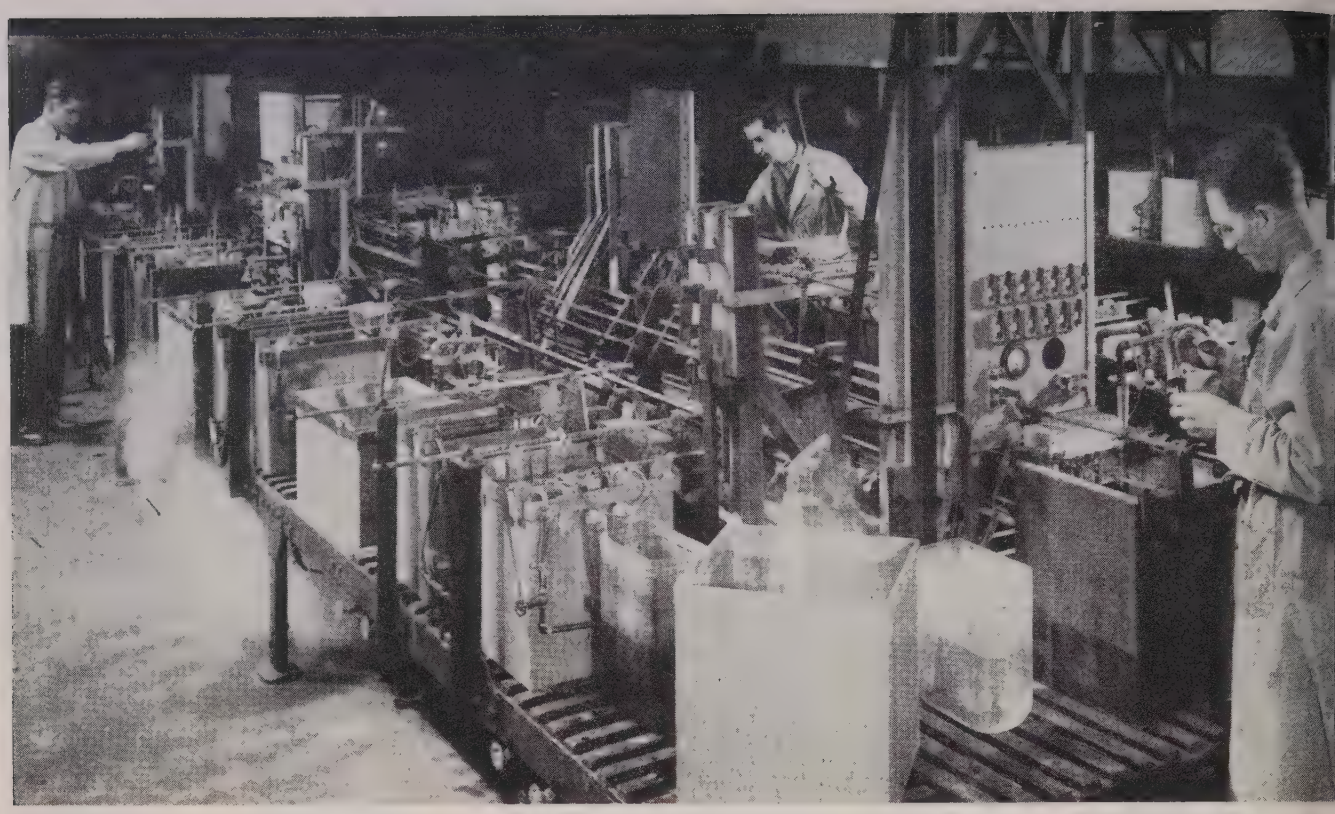


Battelle Institute pilot plant f
research on metal surface treatme

By W. G. SCHICKNER,
JOHN G. BEACH and C. L. FAUST
Battelle Memorial Institute
Columbus, O.

How To Braze and Solder Zirconium

Zirconium is important in atomic power plants because of its corrosion resistance and favorable neutron properties. After dipping in zinc chloride, it can be soldered and brazed

ZIRCONIUM PARTS can be soldered and brazed by regular methods if they are dipped in molten zinc chloride beforehand. This pretreatment deposits a thin coating of zinc on the surface. Hot dipped coatings of tin or lead may also be applied after the zinc dip.

The desired zinc film is deposited on zirconium from molten zinc chloride in the temperature range of 825 to 840° F. The need for sublimation of the zirconium tetrachloride formed at the zirconium surface establishes the minimum temperature of zinc coating at about 570° F. However, temperatures above the melting point of zinc, (786° F) give the best zinc films.

Zirconium and its alloys cannot be soldered, brazed, or hot dip coated using conventional methods for treating other metals. Ordinary fluxes either do not remove the zirconium surface film or do not provide a surface easily wet by the brazing or hot dipping alloy.

Here's How — Scale-free, clean zirconium surface areas to be brazed are immersed in molten zinc chloride. Commercial zinc chloride is satisfactory for making up the dip. For best results, the immersion time used is that required allow the surface temperature the area to be coated to exce 786° F. For samples, 1/2-1/1 inch thick, 1 minute immersi time is sufficient. For cylinde ¾-inch in diameter and 6-inch long, 5 to 10 minutes are require Gassing of the zirconium surfa caused by evolution of the volati zirconium tetrachloride is evide during immersion.

The zirconium part is remove drained, and cooled in air for abo 15 seconds and then quenched water to wash off the entrain salt. A smooth mat coating of zi

ains on the zirconium surface. s can then be tinned, soft sol- d, or silver soldered by conven- al means.

op-off — When zinc coating is ed in localized areas of the nium parts, satisfactory mask- of the surrounding area is ob- ed by an envelope coating of roplated nickel. After the zinc ing operation the nickel en- pe is peeled off.

ethods Used—Molten salt baths in the experimental work to lop the new process were held yrex containers and heated by type electric furnaces. Tem- tures were controlled, using boro potentiometer controllers suitable protected thermo- ples.

lver soldering was done with ir-natural gas hand torch using rentional silver solder having a ing point of 1070° F, and a dy & Harman brazing flux. soldering was done with a k-heating soldering gun, using lar 50-50 lead-tin solder and paste flux. Hot dip tin and solder coatings were applied r wiping the zinc coated zir- um surface with soldering e. Hot dip coating of zinc ed zirconium with higher melt- point metals and alloys can bably be accomplished using able fluxes.

ow Strong? Strength of the d between the zirconium and brazing or hot dip coating was uated by qualitative tests. A nch brass rod was soft soldered pendicular to the zinc coated specimen. The joint was tested by applying a force on the rod about 6-inches from the joint. The strength of the joint was greater than the strength of the soft solder (about 6000 psi). Similarly, a ¼-inch square steel bar was silver soldered to the base of another zinc coated specimen. The joint approached the strength of the silver solder. The specimen was bent severely without breaking the joint.

Doesn't Work for Titanium—Attempts to coat titanium by immersion in molten zinc chloride were unsuccessful. The titanium surface developed a blue passive film without any apparent displacement of zinc. Since both $ZrCl_4$ and $TiCl_4$ are volatile at 750° F, reasons for the different reactions in the two metals were studied.

Table shows values for free energies of formation of zirconium and titanium compounds. The free energies for zirconium in the reactions suggest the ultimate formation of $ZrCl_4$. Since $ZrCl_4$ sublimes at temperatures above about 575° F, the reaction is forced to the right. On the other hand, the free energies for titanium in the reactions suggest the formation of $TiCl_2$ and/or $TiCl_3$, but the formation of $TiCl_4$ appears improbable. Since $TiCl_3$ is nonvolatile at these temperatures and apparently not soluble in zinc chloride, the reaction is stopped.

REFERENCE

This work was performed under AEC contract W-7405-eng-92. Data in table from *The Chemistry and Metallurgy of Miscellaneous Materials, Thermodynamics,* Lawrence L. Quill, editor, McGraw-Hill Book Co. Inc., National Nuclear Energy Series, 1950.

Salt	Free Energy of Formation, △ F, kcal/mole
$ZrCl_2$	-119.5 ± 20
$ZrCl_3$	-174.4 ± 20
$ZrCl_4$	-179.9 ± 20
$ZnCl_2$	80.0
$TiCl_2$	89.8 ± 10
$TiCl_3$	-127.4 ± 10
$TiCl_4$	$153. \pm 10$

Reactions	Free Energies, kcal M = Zr	M = Ti
$M + 2ZnCl_2 \rightarrow MCl_4 + 2Zn$	-39.5 ± 20	-9.8 ± 10
$2M + 3ZnCl_2 \rightarrow 2MCl_3 + 3Zn$	-108.8 ± 20	-15.8 ± 10
$M + ZnCl_2 \rightarrow MCl_2 + Zn$	19.9 ± 20	$+7.0 \pm 10$

Cranes: No Swing, No Sway

Servomechanism control results in increased handling safety and accuracy

ANTI-SWING crane with anti-creep variable speed hoisting has been developed by engineers at Remote Control Engineering Division, Argonne National Laboratory. The development, according to the laboratory's announcement, promises increased safety and accuracy in handling hazardous materials.

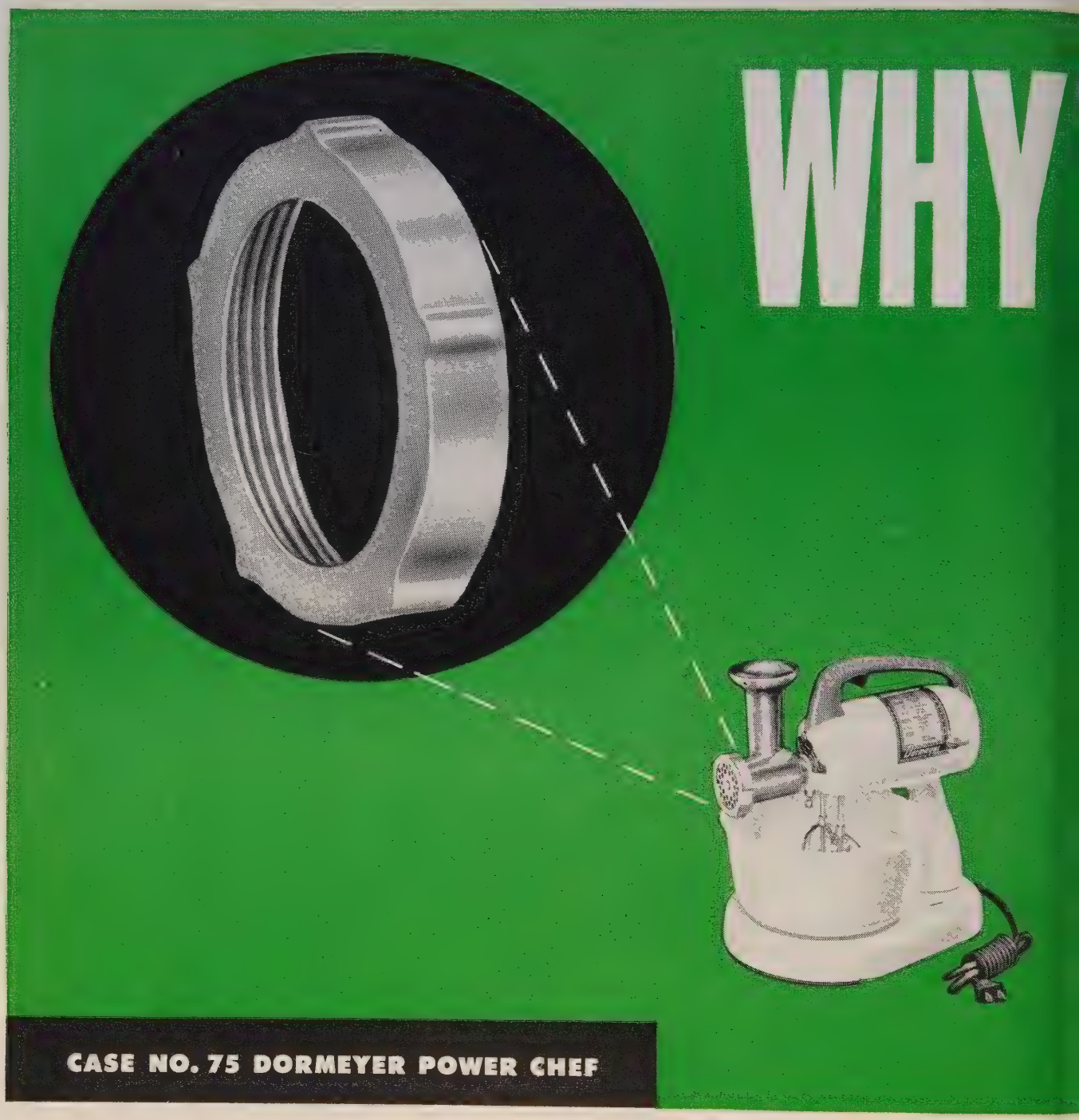
In a model of the crane, pendulum-like swinging of hook and load has been reduced to a minimum while vertical load creep is completely eliminated. With this type of crane control, radioactive and thermally hot materials can be transported without need for having personnel to guide and steady the hook and load.

Servomechanism Control — In the Argonne-developed model, the normal carriage drive has been replaced with a servomechanism that moves the carriage in accordance with electrical signals. In operation, the crane operator determines direction he wishes the crane to travel and turns a control knob on the instrument panel. The crane automatically moves in the direction chosen, and while doing so transmits electrical signals to the servomechanism regarding its position, speed of movement and amount of load swing.

The servomechanism adds these positive and negative signals to those placed into the servomechanism when the crane operator adjusted the control knob. A summation of the signals equaling zero means that the crane has reached its desired position.

Variable Speed Drive—An electrical signal that indicates degree of load swing causes a slight movement of the crane's carriage in the direction of the swing. This action allows the load to dissipate its oscillatory energy into the carriage and, as a result, the load stops swing within two cycles.

The crane is also equipped with a continuously variable speed drive for hoisting operations. This assures smoother and more accurate vertical load control than is possible with conventional cranes.



Even small parts can help reduce production costs and increase sales appeal. This aluminum nut for the grinder attachment of the popular Dormeyer Power Chef is a small part with a big job. Stock for the nut is Reynolds Aluminum drawn round tubing. Manufacturing costs are lowered because aluminum is an economical material. It is readily worked on automatic screw machines and requires no costly finishing operations.

Aluminum has proved a wise choice for this nut from a sales standpoint, too. This aluminum nut will not rust—can not contaminate food. Its resistance to corrosion assures a permanently attractive, smooth, easily cleaned surface . . . so essential for proper care of food handling equipment. The immunity to rust with no surface finish to chip or wear off, assures the utmost in durability and long, trouble-free life.

Regardless of size—from shoe eyelets to ocean liners—you probably can put aluminum to profitable use in the products that concern you. Whether you use only a fraction of a pound of metal or several thousand pounds per item, you'll find you can speed production, increase capacity, lower costs and add new sales appeal with Reynolds Aluminum.

LET ALUMINUM SERVE YOU, TOO

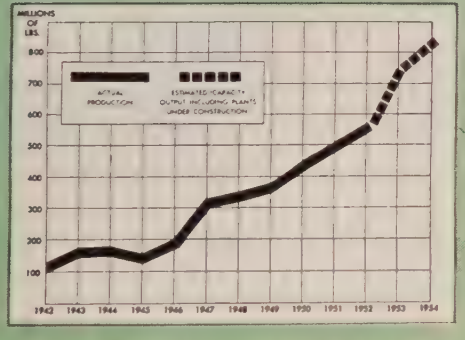
ALUMINUM?

...because it has an ideal combination of advantages found in no other metal!

More aluminum is being specified in designs today because aluminum improves products and increases sales. Let Reynolds Aluminum Specialists help your designers and engineers get maximum benefits from this modern metal. Remember, only aluminum gives you . . .

- ★ **Lightweight with great strength**
- ★ **Consistently low cost**
  no more now than before World War II
- ★ **Natural resistance to rust and corrosion**
- ★ **Attractive appearance**
- ★ **Ease of fabrication by modern methods**

STILL MORE ALUMINUM COMING



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Acquaint yourself with accepted techniques for fabricating aluminum. Write on your letterhead for aluminum fabrication books listed at right. On special problems consult with Reynolds staff of aluminum specialists. Reynolds Metals Company, 2520 South Third Street, Louisville 1, Kentucky.

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  (Aluminum Alloys and Mill Products)
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- Aluminum Powders and Pastes
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- Fastening Methods for Aluminum
- Finishes for Aluminum
- Forming Aluminum
- Heat Treating Aluminum Alloys
- Machining Aluminum Alloys
- Welding Aluminum
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Complete index of all technical literature and films on aluminum design and fabrication also available.

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REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

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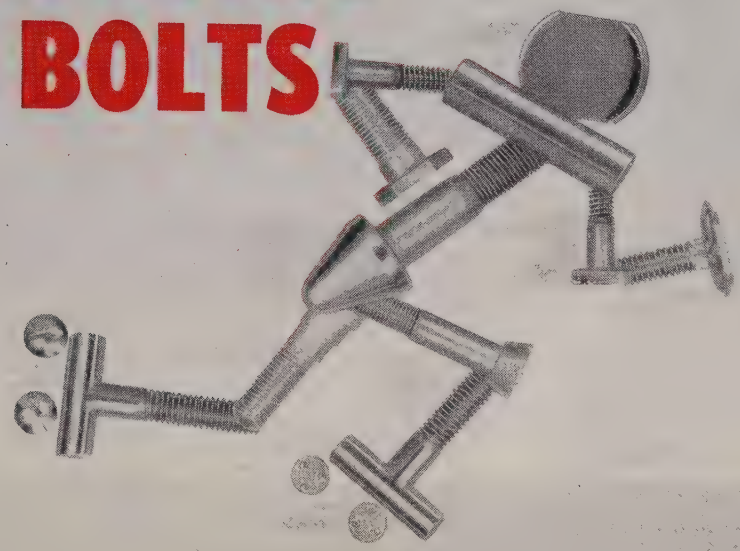

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CALENDAR OF MEETINGS

May 3-7, Liquefied Petroleum Gas Association: Annual meeting and exhibit, Hotel Conrad Hilton, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 4-6, National Small Businessmen's Association: Annual meeting, Hotel Mayflower, Washington. Association address: Evanston, Ill. Vice president: A. W. Kimball.

May 4-6, Automotive Engine Rebuilders Association: Annual spring meeting, Netherland Plaza hotel, Cincinnati. Association address: 419 N. Capitol Ave., Indianapolis. Executive vice president: R. G. Patterson.

May 4-8, American Foundrymen's Association: Annual meeting, Chicago. Association address: 616 S. Michigan Ave., Chicago 5. Secretary: W. W. Maloney.

May 6-7, National Metal Trades Association: Mid-Atlantic assembly, Bellevue-Stratford hotel, Philadelphia. Association address: 549 W. Randolph St., Chicago. Secretary: Louie W. Silvis.

May 6-8, American Society of Training Directors: Annual meeting, Sheraton Plaza hotel, Boston. Society address: 2020 University Ave., Madison 5, Wis. Secretary: Russell L. Moberly.

May 6-8, Porcelain Enamel Institute: Mid-year divisional meetings, Edgewater Beach hotel, Chicago. Institute address: 1346 Connecticut Ave. NW, Washington 6. Secretary: John C. Oliver.

May 7-8, The Wire Association: Regional meeting, Mt. Royal hotel, Montreal. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 7-8, Industrial Fasteners Institute: Annual meeting, Westchester Country Club, Rye, N. Y. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 8, American Society for Metals: New England regional meeting, Hotel Bond, Hartford, Conn. Information: Walter E. Borin, Underwood Corp., Hartford 6, Conn.

May 11-13, Rail Steel Bar Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

May 11-14, American Mining Congress: Annual meeting and exposition, Public Auditorium, Cleveland. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

May 14, Conference, Instrumentation in Water, Sewage and Industrial Waste Treatment: Manhattan College, New York. Information: Joseph McCabe, Civil Engineering Dept., Manhattan College.

May 14-15, National Association of Sheet Metal Distributors: Spring meeting, Deshler-Wallick hotel, Columbus, O. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fernley Jr.

May 14-16, American Coal Sales Association: Annual spring meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 1625 Eye St. NW, Washington. Executive vice president: W. W. Bayfield.

May 14-16, American Institute of Mining & Metallurgical Engineers: Pacific Northwest metals and minerals conference, Hotel Benjamin Franklin, Seattle. Institute address: 29 W. 39th St., New York 18.

May 18-19, National Fluid Power Association: Organization meeting, Bedford Springs hotel, Bedford Springs, Pa. Association address: 1618 Orrington Ave., Evanston, Ill. Temporary executive secretary: Barrett Rogers.

May 18-19, Association of Iron & Steel Engineers: Spring meeting, Hotel Statler, Buffalo, N. Y. Association address: 1010 Empire Bldg., Pittsburgh. Secretary: T. J. Ess.

May 18-20, Industrial Furnace Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York.

May 18-22, Material Handling Conference and Exposition: Convention Hall, Philadelphia. Information: Banner & Greif, 250 W. 57th St., New York 19.

New "slant" on DELTA Drill Presses boosts output at Atlantic Service Co.

Easier cleaning, better lubricant flow, reduced operator fatigue are extra benefits for Brooklyn shop.

A gang set-up of eight Delta 14" Drill Presses mounted at an angle of about 30° and operated by one man, boosted output and made a healthy cut in costs for Atlantic Service Co., Brooklyn, N.Y. This production speeding hook-up was possible because versatile Delta Drill Presses *operate in any position:* upside down, sideways, at any angle.

All spindles in Atlantic's set-up are connected to a master shaft and move simultaneously. Parts to be drilled are held on adjustable jigs. As many as 100 holes are drilled in each piece.

The tilted table is easy to keep clean, improves lubricant flow, makes the operator's job much easier—all of which contribute to a competitively low production cost.

Why not work out your own money-saving slant . . . as thousands of resourceful shop men are doing? Your Delta dealer can help you—he's listed in your Classified Telephone Directory under "Machinery" or "Tools". Write for the latest Delta catalog. Delta Power Tool Division, Rockwell Manufacturing Co., 638E N. Lexington Avenue, Pittsburgh 8, Pa.

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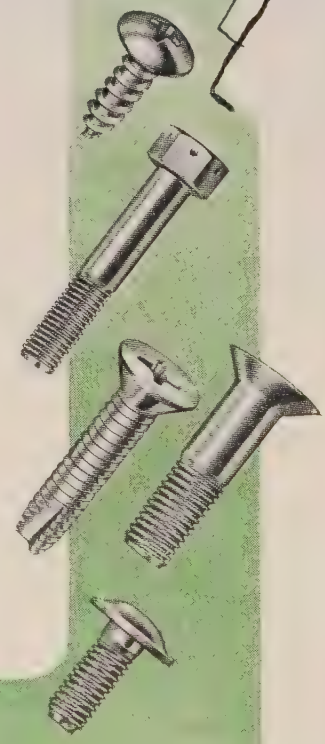

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"PRODUCTION-DESIGNED FOR YOUR ASSEMBLY LINE"

May 18-22, Conference, Cam Design and Tool Selection: Rochester Institute of Technology, Rochester, N. Y. Information: Robert D. Pease, associate director, RIT.

May 20-22, Gas Appliance Manufacturers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 60 E. 42nd St., New York 17. Secretary: H. Leigh Whitelaw.

May 20-22, Society for Experimental Stress Analysis: Spring meeting, Hotel Schroeder, Milwaukee. Society address: Box 168, Cambridge 39, Mass. Secretary-treasurer: W. M. Murray.

May 21-22, National Industrial Conference Board: General session and directors meeting, Waldorf-Astoria hotel, New York. Board address: 247 Park Ave., New York. Secretary: Clyde L. Rogers.

May 24-27, Copper & Brass Research Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: B. B. Caddle.

May 24-28, Scientific Apparatus Makers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 20 N. Wacker Drive, Chicago 6. Executive vice-president: Kenneth B. Anderson.

May 24-28, National Industrial Service Association: Annual convention, Hotel Statler, New York. Association address: 818 Olive St., St. Louis 1. Executive secretary: Fred B. Whipperman.

May 26-27, Electric Heating Committee and Michigan Section, AIEE: Conference, Detroit-Leland Hotel, Detroit. Institute address: 33 W. 39th St., New York 18. Information: W. C. Rudd.

June 1-3, American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22. Secretary: John C. Sears.

June 7-12, Society of Automotive Engineers: Annual summer meeting, Hotels Ambassador and Ritz-Carlton, Atlantic City, N. J. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

June 8-9, Malleable Founders Society: Annual spring meeting, The Homestead, Hot Springs, Va. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

June 9-12, National District Heating Association: Annual meeting, Hotel Lookout Mountain, Chattanooga, Tenn. Association address: 827 N. Euclid Ave., Pittsburgh 6. Secretary-treasurer: John F. Collins Jr.

June 14-19, National Association of Cost Accountants: Annual meeting, Hotel Statler, Los Angeles. Association address: 505 Park Ave., New York 22. Secretary: Arthur B. Gunnarson.

June 15-18, Radio-Television Manufacturers Association: Annual meeting, Palmer House, Chicago. Association address: 777 14th St. NW, Washington 5. Secretary: James D. Secrest.

June 15-18, American Electroplaters' Society: Annual meeting, Benjamin Franklin hotel, Philadelphia. Society address: 445 Broad St., Newark, N. J. Secretary: D. Gordon Foulke.

June 15-19, Basic Materials Conference and Exposition: Grand Central Palace, New York. Information: Banner & Greif, New York 19.

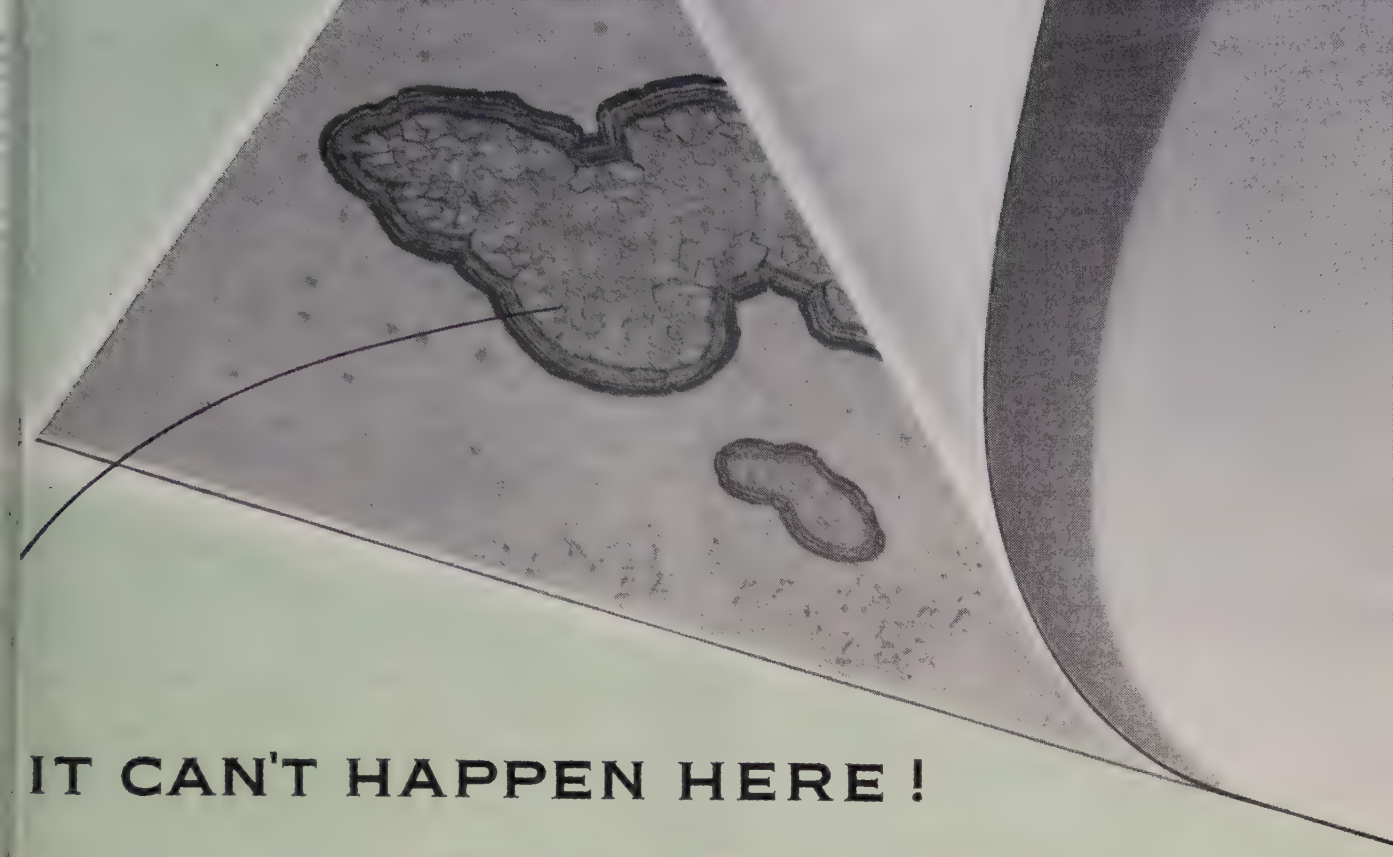
June 15-19, American Institute of Electrical Engineers: Summer general meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

June 16-19, American Welding Society: National spring technical meeting & welding and allied industry exposition, Shamrock Hotel and Hall of Exhibits, Houston. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

June 22-25, National Industrial Advertisers Association: Annual meeting, William Penn hotel, Pittsburgh. Association address: 1776 Broadway, New York. Executive secretary: Blaine G. Wiley.

June 28-30, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y. Secretary: E. A. Schoefer.

June 29-July 3, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society address: 1916 Race St., Philadelphia. Secretary: Robert L. Painter.



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Is Permanently Protected Against Underfilm Corrosion

Weirzin steel strip is protected for life against costly underfilm corrosion. The tight, malleable zinc-coating actually becomes a part of the steel and remains intact even under extreme conditions of temperature and humidity. Further protection against corrosion is offered in Weirzin treated with Bonderite—and is recommended for any parts subject to atmospheric corrosion, or for enameled, lacquered or painted parts. Exhaustive tests have proved that the added protection that Bonderite offers is worth double its cost. Also of great interest is the fact that fabrication of Weirzin does not weaken the protective coating. After deep drawing, forming and punching, the zinc-coating remains unruptured and evenly deposited. You can be sure that your product is protected when you use Weirzin. Send for a sample today—make your own tests—see how your product can be made better . . . with Weirzin.

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60-cycle induction BILLET HEATER

THIS Loftus Universal Thermo-Induction f
nace is the most flexible 60-cycle billet hea
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metal, in the same furnace, either consecutiv
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efficiency, constantly, even wh
heating **short-length** billets.

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you the most practical, depe
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achieve uniform heating in a matter of secon
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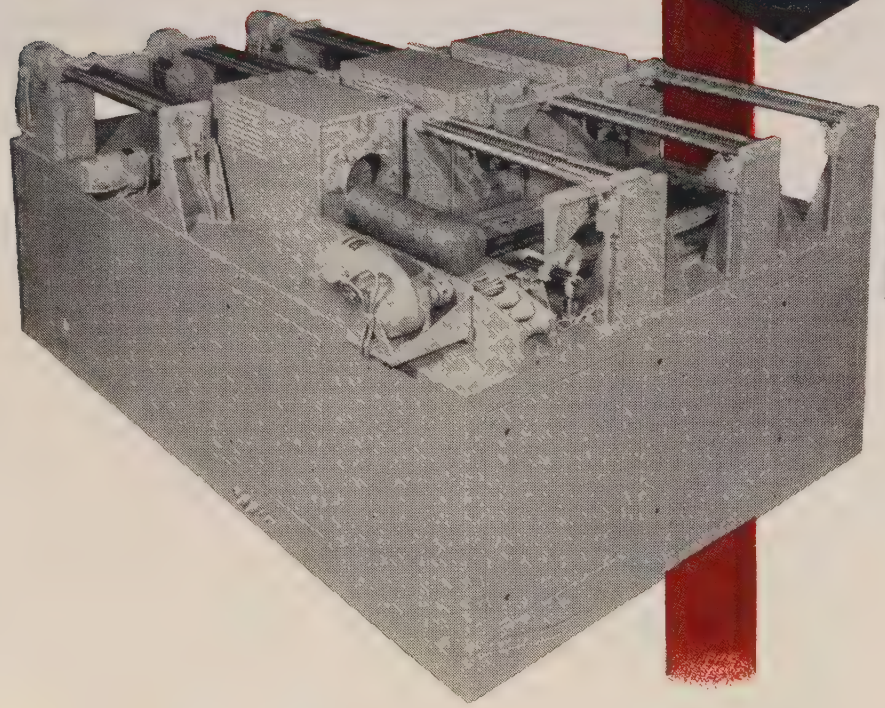
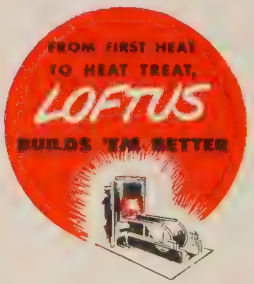


The Loftus 60-cycle Thermo-Induction He
illustrated is designed to heat copper, br
aluminum, and cupro-nickel for extrusion
poses. The unit is readily adaptable
forging and rolling processes. It is
sible, with this billet heater to heat a
dia. Aluminum billet to 800° F., an 8"
brass billet to 1550° F., and a 10" dia. cu
nickel billet to 1950° ALL AT THE SAME TI
IN THE ONE FURNACE. Each billet is hea
independently . . . from a single control po



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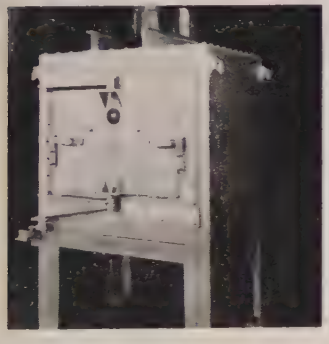
NEW PRODUCTS and equipment

Reply cards on page 131 will bring you more information on any new products and equipment in this issue

ectric Box Draw Furnace

. . high volume batch work

This electric box draw tempering rnace is designed for applications quiring no protective atmosphere. he type DB is used for batch rawing or tempering high volume ork that can be handled on trays.



laximum operating temperature is 400° F; an automatic temperature ontrol regulates any heat within is range accurately. High-velocy centrifugal fan provides uniorm air circulation over the heatng elements and around the charge. To prevent uneven heating round the periphery of the charge, steel baffle plate provides dead ir space between heating elements nd the charge chamber. Heat losss are held to a minimum through se of a plug-in type furnace door hat pivots as well as swings. Westnghouse Electric Corp., Dept. ST, Box 2099, Pittsburgh 30, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

mproved Gas Welding Hose

. . working pressure: 200 psi

Improved neoprene synthetic rubber hose for gas welding apparatus withstands greater heat and flame han its predecessors. Also noteworthy is its light weight and ability to resist grit, sharp metal and oil to which this type of hose is frequently exposed. Toughness results from a rayon reinforced carcass that ups strength and extends life.

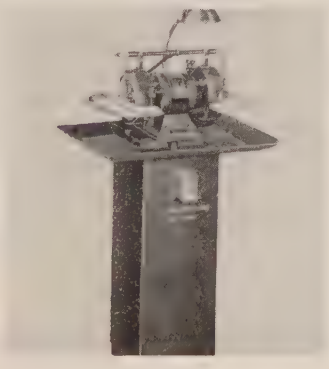
The hose has double tubes, one for acetylene gas and the other for oxygen, both vulcanized together to form an integrated whole. Working pressure reaches 200 psi. Hewitt-Robins Inc., Dept. ST, 666 Glenbrook Rd., Stamford, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Wet Carbide Grinder

. . . separate coolant pump

Model AW wet carbide grinder is an adaptation of the manufacturer's model AA machine, equipped with adequate coolant.



Machine embodies all features of the regular model AA, including quick-acting index tables that can be set instantly and exactly to the required angle. In addition, it has a separate motor-driven coolant pump and assembly. Drum type on-off reverse switch, combination protractor tool-guide and truing tool holder, electric light and brake are also included.

All types of grinding wheels, diamond wheels and accessories normally available for the model AA are available for the new model. Thomas Prosser & Son, Dept. ST, 120 Wall St., New York 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Antirust Paint Line

. . . three colors added

Formerly available only in black, clear and aluminum, the manufacturer's anti-rust paint line is

offered in three more colors: Light gray, oxide red and chrome green. Paints can be applied over rusty surfaces without wire brushing, scraping or sandblasting and without use of a primer coat.

Penetrating to the clean metal, they seal against further rust or corrosion. Application can be made by brush, spray, roller or dip —indoors or out. Paint Corp. of America, Dept. ST, Fidelity Bldg., Cleveland 14, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

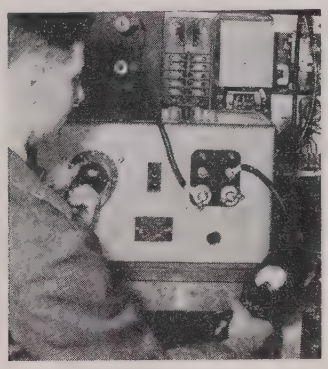
Portable Current Test Unit

. . . reduces equipment failures

Reduced electrical equipment failure as a result of simple checking and calibrating of current-actuated protective devices is gained by this portable test unit. Attendant effect is reduced threat of electrical fire. Called the Industrial

Multi-Amp, the portable tester makes it possible to test circuit breakers, overload relays and other current-actuated devices before, during and after installation.

Testing entails only connection to output terminals and adjusting



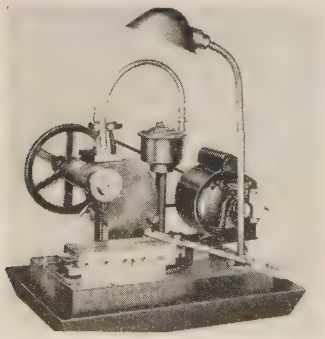
to proper value, while observing a current indicating instrument and timer. When results are checked against the manufacturer's published time-current curves or against a typical calibration table, result is a quick indication of whether the protective device is protecting. Multi-Amp Corp., Dept. ST, Harrison, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Light Bench Type Mill

. . . speeds to 7000 rpm

This bench-type mill, adaptable to a wide range of light milling operations, has interchangeable pulleys that make possible a wide range of speeds to 7000 rpm. The complete unit, with base dimensions of 11 x 18 inches, is light and easily portable. Spindle is designed with a 13/32-inch through



hole and No. 7 Brown & Sharpe taper for mounting arbors, shanks and adaptors. Powered with a 1/3-hp single-phase motor, the mill operates on standard 110 v, 60-cycle ac.

A precision setup block 3½ x 9 x ¾ inches is machined with keyways on top and bottom at right angles. Single slide table having large dovetail ways and adjustable gibs permits 4 inches travel and has adjustable limit stops at both ends. The complete assembly is also equipped with a self-contained motor-driven coolant pump. Viking Industries, Dept. ST, 220 Montague St., Rockford, Ill.

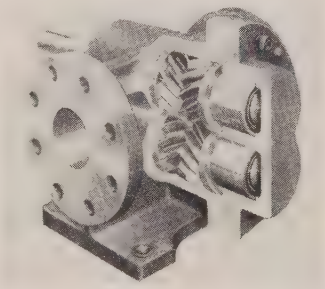
FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Rotary Gear Pump

. . . design simplified

Simplified rotary gear pump is designed primarily for positive displacement of lubricating liquids. It will handle fluids and semi-fluids from 32 to 250,000 ssu. Capacities: 1 to 500 gpm; 300 psi for continuous duty and 500 psi for intermittent service.

Two castings are used for body and head. The two rotors are the



only moving parts. No inner races are needed in the bearings, because the shafts are hardened and ground at the bearings. Sier-Bath Gear & Pump Co. Inc., Dept. ST, 9252 Hudson Blvd., N. Bergen, N. J.

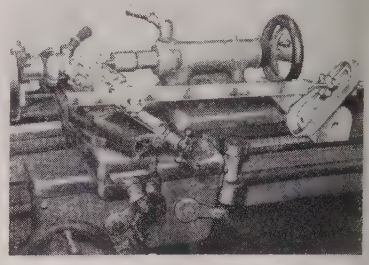
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Lathe Duplicating Attachment

. . . specified for short runs

Simple, compact profile tracing attachment is designed for runs too short to warrant setup time necessary when using long-run equipment. Its heavy duty construction permits small shops to produce sizable quantities of turnings. Model EL-1100 is designed for lathes handling up to 13-inch work. Installation or removal can be completed in a few minutes without alterations to the lathe.

Accurately ground ⅛ x 2-inch wide gage stock templates are r quired to guide the movement the slide. Template length is lim ited only by the length of the lath Boring and inside diameter co tours can be turned by the sam method as conventional outside d



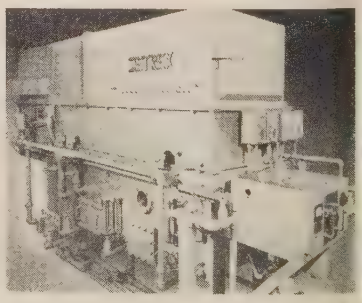
ameter turning. A 90-degree ste can be cut in the direction of th feed. The tracer can be used effec tively for all kinds of outside di ameter turning, including tapers It will make an 0.031 minimum ra dius and turn an unlimited max imum radius. Air Control Division Lehigh Foundries Inc., Dept. ST 1500 Lehigh Dr., Easton, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Ultrasonic Metal Cleaner

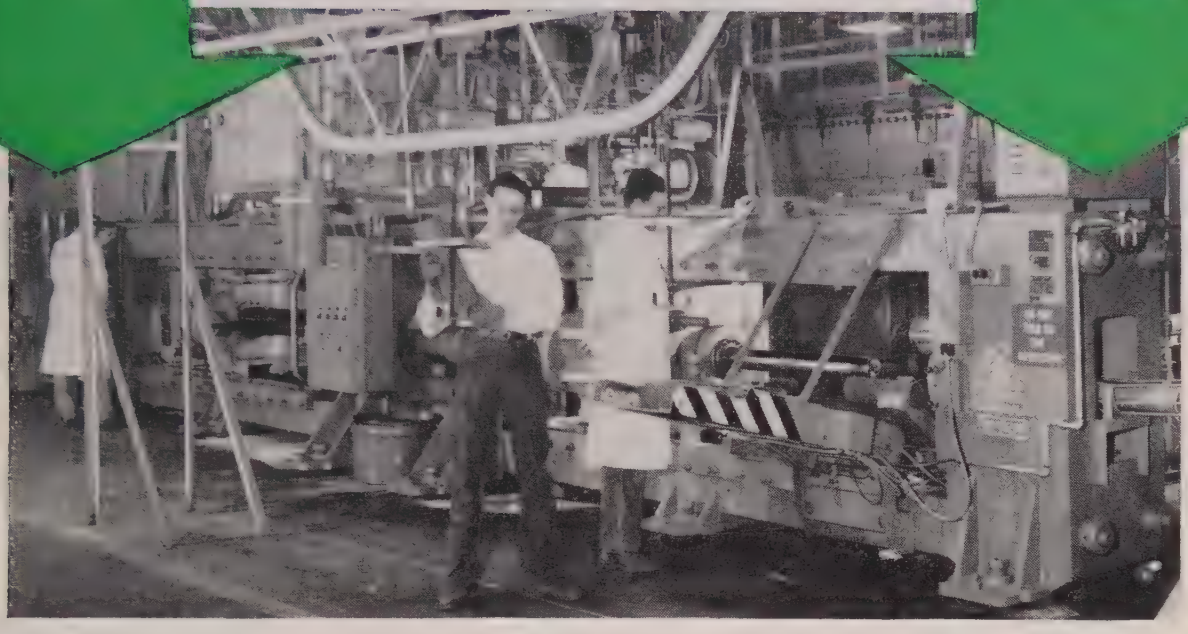
. . . converts electrical energy

Element for converting electr cal energy into high-frequenc sound waves is the key factor i this metal cleaning equipmen The element, called a transduce engineered jointly by the manu facturer and Brush Electronic Co is a curved piece of ceramic r sembling a pipe cut in half. special generator, operating on o dinary current, delivers electric energy at 400,000 cycles per se ond to the transducer where it converted into sound energy an directed through the cleaning me dium.



The process removes dirt, grea chips and general soils from t most intricately designed and clos fitting parts in a matter of se

1 press does the work of 2



CLEARING Helps Rheem Boost Production

When Rheem Mfg. Co. took on the job of producing cartridge cases, they tooled up their New Orleans plant with a new type of Clearing hydraulic press—a press that revolutionizes cartridge case production.

The new Clearing double end press produces at both ends of the stroke—does the work of two conventional presses. While one slide has completed a draw and is on its return stroke, the other slide is performing a drawing operation on the opposite end of the press.

Clearing horizontal double end presses represent savings not only in capital investment, but they require less manufacturing space and less maintenance than two conventional presses. Double end presses also reduce original installation cost, productive labor cost, and power consumption—since only one hydraulic drive unit is used.

The double end press was Clearing's answer to the problem of cartridge case manufacture. Supplying the right answers to manufacturers who make all types and sizes of products has been a strong point with Clearing engineers for years. If you have a problem involving power presses, you'll find the best answer at Clearing.

lor Movie—"A Better Way Manufacture Shell Cases" See new Clearing double nd presses in action. This ovie is available for show- gs in manufacturing plants to technical groups. Write dvertising Dept., Clearing Machine Corporation.

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS

HAMILTON DIVISION—HAMILTON, OHIO

CLEARING PRESSES THE WAY TO EFFICIENT MASS PRODUCTION

CMC CLEARING

DON'T get your neck in a NOOSE!

Use Milford's scientific approach to your fastening problem.

If you were solely responsible for recommending a machine tool for your company's production needs, you'd make pretty certain that your choice would perform correctly, efficiently, with the lowest possible dollar expenditure. Right?

It's important, too, to do likewise in recommending fasteners, and functional components that may be cold-headed. Millions of dollars yearly are wasted by not giving these parts . . . at the design stage . . . the same careful scrutiny that is given major production equipment.

Why not consult our cold heading engineers before designs are "frozen" . . . while planning is fluid enough to save you excessive costs?

EST. 1919

MILFORD

the name to rivet in your memory for fasteners

THE MILFORD RIVET & MACHINE CO.

931 Bridgeport Ave., Milford, Conn.
880 Illinois Ave., Aurora, Ill.
1160 W. River St., Elyria, Ohio
80 Platt Street, Hatboro, Penn.
757 So. Palm Ave., Alhambra, Calif.

onds. Parts are passed throug the general area of greatest foc intensity, either manually or b a conveyor system, and are cleane instantly. Detrex Corp., Dept. ST Detroit 32, Mich.

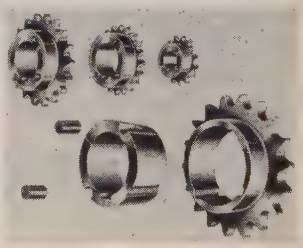
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Roller Chain Sprocket Line

. . . no reboring to fit shafts

Line of Taper-Lock stock rolle chain sprockets presents a desig keyed to shafts for easy, quick in stallation and removal. Althoug sprockets grip shafts with th firmness of a shrink fit, it is un necessary to turn and grind th shaft.

Sprockets have no flanges o protruding parts and require n more space than standard units



Flush hub design contributes t safe operation. The sprockets fi any roller chain manufactured t American Standards No. 4 through 100. Number of teeth range as high as 112. Morse Chai Co., Dept. ST, 7601 Central Ave. Detroit 10, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Portable Angle Iron Cutter

. . . hand pump hydraulic actio

Cutter added to the manufactur er's hydraulic Guillotine lin shears angle iron cleanly an causes no end deformation. Th unit is available in portable mod els with hand-pump hydraulic ac tion. For production cutting ap

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Just circle the corresponding number of any item in this section for more information.

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TEAR OUT CARD, FILL IN and MAIL TODAY!

Analysis Instruments

ird Associates, Inc.—"Infrared ysis of Terramycin" and "Qual- Control Analysis" are two of the rs included in volume 4, No. 1, he Baird house organ "Better lysis".

Weighing Instrument

rthur S. LaPine & Co.—The Metro- n, a high capacity precision hing instrument made in elec- ic or mechanical models is sub- of descriptive 4-page bulletin. Ca- ties of instrument range 50 grams or 110 lb. and sensitivities within plus or minus 10 milli- ns.

Fastening Techniques

ilford Rivet & Machine Co.—A ntific approach to products and s assembly is considered in 12- e brochure "The Milford Method." describes integrated service of ener research, design, application ineering and production collabora- offered by company.

Communication System

armers Engineering & Mfg. Co.— ormation on electronically ampli- voice communication via micro- ne and loudspeakers for mines and nts is given in bulletin 26. Data ludes application, ordering infor- tion, typical wiring diagram and mponent parts of the system.

X-Ray Tools

North American Philips Co., Re- rch & Control Instruments Div.— acts and Figures on Three Power- X-Ray Tools for Non-Destructive alysis" is 8-page booklet which grams operating principles of three truments, gives data on fields of lication and explains results to be obtained. How a film diffraction unit can be converted to spectrometer and spectrograph use is illustrated.

73. Disk Grinders

Gardner Machine Co.—Revised edition of 16-page catalog S-52 illustrates and describes full line of single spindle disk grinders. Specifications, machine features and applications are detailed, along with standard and optional equipment and accessories.

74. Heat Treating Equipment

Pressed Steel Co.—General catalog No. 52 of 24 pages describes and illustrates line of heat treating equipment, including containers, fixtures and retorts for carburizing and annealing; tubing for annealing, firing radiant furnaces, venting noxious gases and protecting thermocouples; and a wide variety of similar products.

75. One-Shot Lubricator

Bijur Lubricating Corp.—Operation of the type LMH one-shot lubricator on a chucking machine and a high speed food wrapping machine is detailed in 4-page illustrated bulletin NB-9.

76. Tunnel Burner Assemblies

Hauck Mfg. Co.— Catalog 807 lists 20 sizes of tunnel burner assemblies for natural or artificial gas and includes data on burner nozzles and gas/air mixers. Application and engineering data and drawing are given.

77. Stamping Presses

Verson Allsteel Press Co.—Entire line of standard mechanical and hydraulic presses and press brakes are described in 16-page illustrated catalog G-52. Condensed specs are given, as is data on special machines.

STEEL 5-4-53

Penton Building, Cleveland 13, Ohio

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5	15	25	35	45	55	65	75	85
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7	17	27	37	47	57	67	77	87
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78. Shipping Containers

General Box Co.—"A Moving Story" is title of 16-page illustrated brochure which serves as a "tour" through the offices and testing laboratory of the company. It tells and shows how various types of containers are tested in a number of ways. Container examples are shown and some case histories are presented.

79. Reduce Shock & Vibration

Fabreeka Products Co.— General properties of Fabreeka, a resilient material for reducing impact shock, vibration and noise, are outlined in 36-page illustrated booklet. Wide variety of machinery and transportation applications are described and much technical data on the subject are included.

80. Industrial Trucks

Lewis-Shepard Products Inc.—In 8 illustrated pages, catalog 34 describes Jacklift Electric and Master Jackstacker industrial trucks. Engineering and operating features are covered along with drawings, specs and maintenance features.

81. Belt Conveyors

Conveyor Specialty Co.— Standard stock belt conveyors for easy, complete assembly in various combinations to meet individual requirements are described in new illustrated folder ML-80-1. Specifications, selection and application data are furnished.

82. Optical Straightedge

F. T. Griswold Mfg. Co.—Utilizing a beam of light as a straight line reference, optical levels are described in catalog 20, which shows how variations in surface flatness can be located and measured to an accuracy of plus or minus 0.00004-in. along a 3-ft segment. A stylus can be used with a feeler microscope to draw a profile on graph paper with vertical movements enlarged 1000×.

83. Induction Holding Furnace

Ajax Engineering Corp.—Characteristics and operation details of combination induction holding furnace and pumping unit for use in die casting of aluminum and zinc alloys are found in 4-page illustrated folder E-296-52. Photos show Ajaxomatic unit in operation.

84. Bricks, Sticks & Stones

Simonds Abrasive Co.—Aluminum oxide and silicon carbide dressing stones for a wide variety of purposes are described in illustrated 8-page catalog called "Bricks, Sticks and Stones." Complete ordering information together with specifications a furnished for each item.

85. Motors & Equipment

Hertner Electric Co.—Bulletin 1 illustrates more than 20 models motor-generators, special motors an switchboards for servicing as man as 80 truck batteries simultaneously It gives graphic picture of compan products line.

86. Solving Saving Problems

Skil Corp.—24-page illustrated man ual "Skil Saw Problem Solver" list 30 different materials and the mos effective method of cutting them with a portable power saw. Prope blade selection, cutting technique an other hints and suggestions are in cluded.

87. Profilometer Equipment

Micrometrical Manufacturing Co —24-page "Catalog of Profilometer Equipment" contains data on com plete line of instruments for measur ing surface roughness height direct ly in microinches. Internal, external straight and tapered surfaces can b measured by equipment.

EDITORIAL REPRINTS:

88. Permanent Magnets

E. E. George of G-E's Carboloy Dept. discusses the increasing appli cation of permanent magnets metalworking jobs in STEEL reprint "Permanent Magnets Attract More Industry Attention." Improved mag netic materials and powder metal lurgy techniques have removed size and shape barriers. The current bot tleneck is civilian shortage of nickel and cobalt.

89. Billet Mill

"Last of the Merry-go rounds" title of STEEL reprint which describe the last repeater table in Americ used to produce billets at Keystone Steel & Wire Co. The old merry-go round has been retired in favor of modern billet mill. Not yet dis mantled, it is sometimes used as stand-by.

90. Stainless Steel Galling

In STEEL reprint "Stainless Steel Galling Characteristics Checked" E Tanczyn describes a new testing method at Armco Steel Corp. which establishes galling load points fo most stainless alloys. Graphical data on these loads are reproducible within 125 psi at loads under 100 lb and within 250 psi above that.

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STEEL

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rations, electric hydraulic pumps available.

apacity of the model A-20-B x 3 x ¼-inch or 2½ x 2½ x 6-inch. Cutters do not have to

bolted down or otherwise unted for operation. Adapta- ns are also available for cut- g special shapes such as chan- or H-beams. Manco Mfg. Co., pt. ST, Bradley, Ill.

MORE DATA—CIRCLE REPLY CARD NO. 11

bular Stock Carrier

. . cuts down congestion

Wire mesh sides provide com- ete visibility at all times in this bular heavy-duty stock carrier, signed to eliminate congestion in ant areas. The 1-ton capacity

rriers can be moved as single nits or as a trackless train. Ver- tile design also provides possi- lities for stacking to six high ith a standard fork truck.

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for a fabulous finish...

JEWEL BRAND

Abrasive Belts

for grinding, sanding, polishing — metal, wood, leather, plastics, rubber.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Massachusetts

Corner posts are made of seamless tubing while corrugated ends and base provide double strength where shock and wear are heaviest. For easy access to contents, sides drop down on heavy-duty hinges. Rack Engineering Co., Dept. ST, Connellsville, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Improved Dial Indicator

. . . adapts for any height gage

Improved Vipp dial indicator is adaptable for use with any height gage. The indicator is versatile, compact and adjustable to all possible positions, enabling the user to get into ordinarily inaccessible places. The unit is easily attached to indicator stand and machines for indicating work being set up, and completed machine parts. It is also furnished with a slitted ball for facilitating indicator chuck setting. A lever on the side of the body reverses direction of contact point movement. The dial is graduated in 0.001-inch increments with a range of plus or minus 0.015-inch. Homestrand Inc., Dept. ST, Larchmont, N. Y.

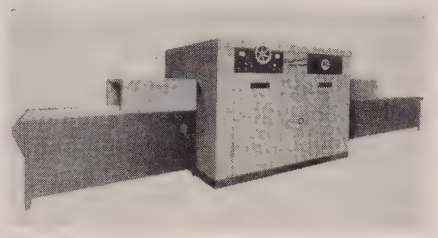
FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Expanded Core Dryer Line

. . . generator section integrated

Latest model Foundromatic core dryer has generator section, previously a separate component, integrated with the oven section to facilitate assembly and improve installation. Additions to the dryer line are 15 and 25-kw units.

Dryer dimensions—20 feet overall by 6 feet, 6 inches wide—indicate economical use of floor space.



Easy accessibility to all electrical components is another characteristic. Loading and unloading area is 9 sq ft. Allis-Chalmers Mfg. Co., Dept. ST, Box 512, Milwaukee 1, Wis.

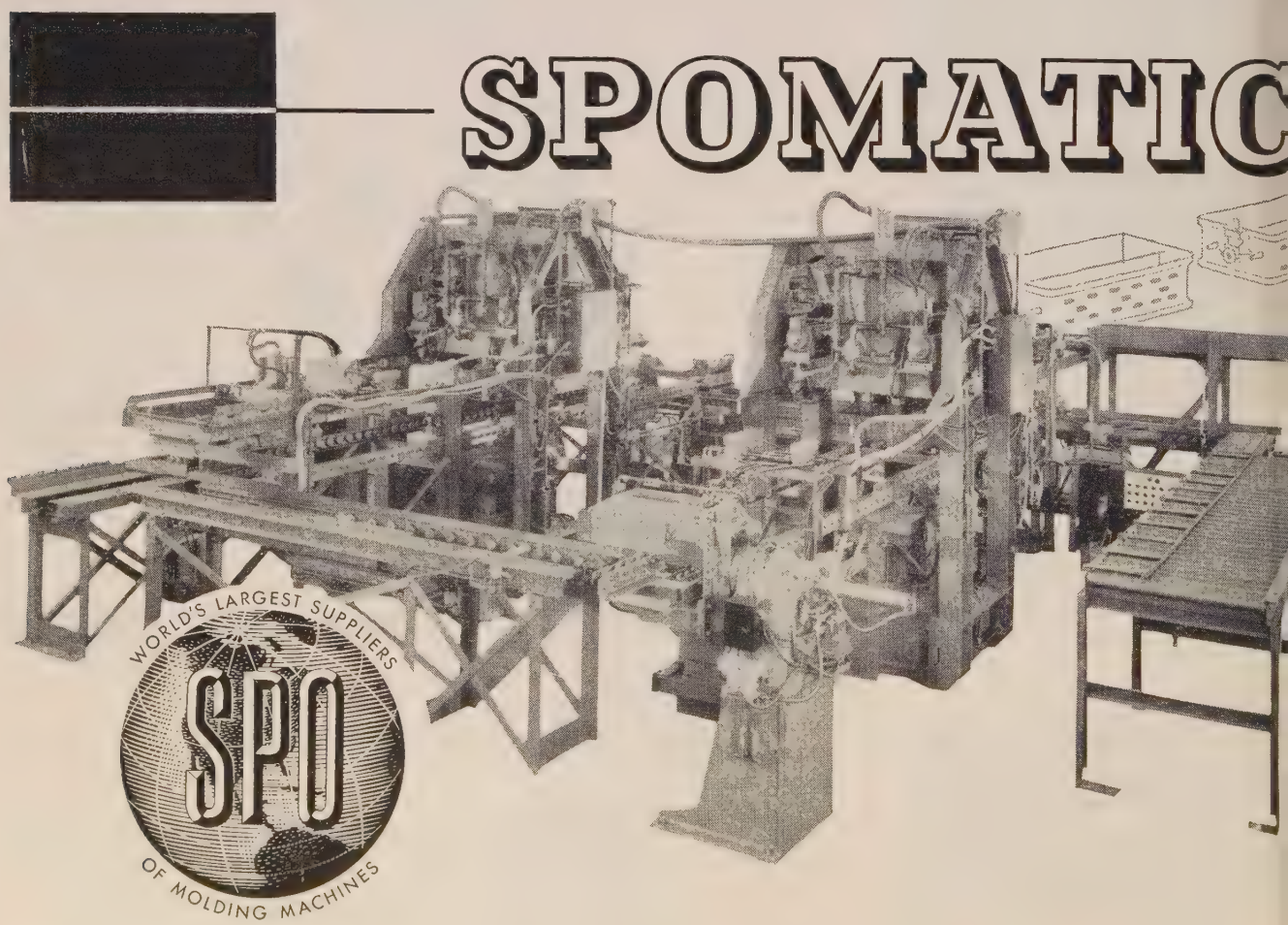
FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Large Diameter Hole Cutter

. . . no gouging, interference

Model 800 Fly Cutter is an improved tool for cutting large diameter circular holes in metal and plastic up to ½ inch thick. Design has produced a device free from cutter gouging and interference at the cutting blade. Construction is entirely of steel.

Adjustable arm that carries the cutting blade is slotted and straddles the hollow shank about the center of its rotation. With this arrangement, the cutting blade remains on the same radial line a

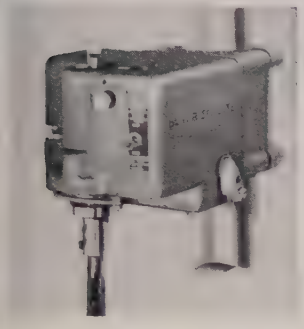


...stments are made for different ... diameters. Arm can be set ...t holes from 1¼ to 5¼ inches ...eter and accessory extension ... reaches 9¼ inches diameter. ... Instrument Co., Dept. ST, 80 ...wbridge St., Cambridge, Mass.
FOR MORE DATA—CIRCLE REPLY CARD NO. 15

...d Screw Tapping Attachment

... attaches in 30 minutes

... takes about 30 minutes or less ...ttach this lead screw tapping



...achment to a drill press, to pro... threads up to class 4. The ...ss can be used for drilling without removing the attachment, which swings out of the way leaving the machine ready for any drilling operation.

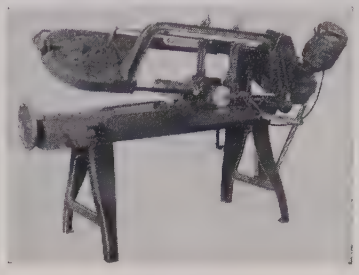
Accuracy of thread is governed by the hardened and ground lead screw which turns in matching bronze nut. These parts are large —1¾-inch diameter—to assure long and accurate service. Accuracy in control of tapped hole depth is obtained by electrically-actuated reversing switches. Boyar-Schultz Corp., Dept. ST, 2110 Walnut St., Chicago 12, Ill.
FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Horizontal Band Saw

. . . high speed steel blade

This horizontal metal cutting band saw capitalizes on advantages of the Milford Rezistor high-speed steel band saw blade. It is reportedly the first band saw to be approved by producers of this blade. Design features that distinguish the model 800 include a heavy-duty counterbalance frame and beam. Band wheels provide for use of 1-inch wide blades. The machine has constant-load blade tensioning device and synchronized speed blade cleaning brush.

Although developed especially for use with the high-speed steel blade, it also can be used effectively with standard carbon steel blades. Machine's capacity is 8 inches diameter. Wells Mfg. Corp., Dept. ST, 1515 Fillmore St., Three Rivers, Mich.



FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Automatic Washer Units

. . . eliminate secondary rinsing

Line of compact, forced-circulation washers is designed to speed metal cleaning through automatic cycling and by combining washing and rinsing in a single operation.

HEART OF THE Automatic Foundry

The new SPOMATIC molding machine makes the automatic foundry of the future possible today!

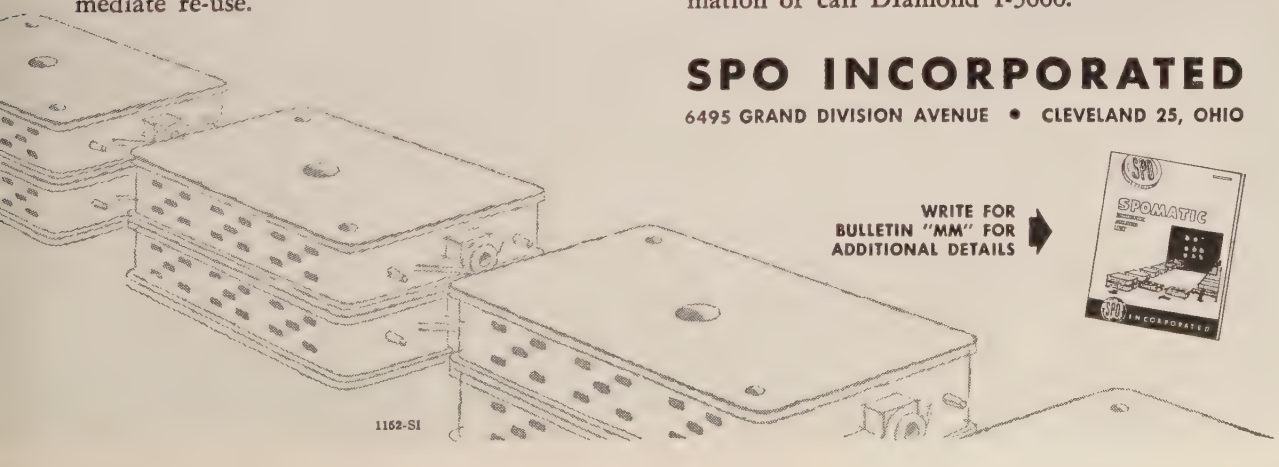
This high-speed mass-production machine makes accurate copes and drags simultaneously . . . sets the cores . . . closes the molds . . . and puts them on the pouring conveyor. Then, after molds have been poured and put through the cooling cycle, the SPOMATIC knocks out, cleans, and separates the flasks and feeds them into their respective ramming unit for immediate re-use.

Once a SPOMATIC is started, *all operations are fully automatic, continuous and mechanical.* Complete operating cycle is set up quickly and easily by means of pushbutton-actuated electrical controls. Master control panel utilizes only two buttons ("ON" and "STOP") and three selector switches.

SPOMATIC installations are engineered to individual foundry requirements. SPO engineers will be glad to discuss your needs and to make recommendations. Write for additional information or call DIamond 1-3666.

SPO INCORPORATED

6495 GRAND DIVISION AVENUE • CLEVELAND 25, OHIO



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1162-SI

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SPEED NOT
TO EXCEED
7000 RPM
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BAY STATE
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EASY ON THE
OPERATOR
OUTLASTS ORDINARY
COATED DISCS 40 TO 1

THE *Versatile* DISC-WHEEL

CUTS, SNAGS

Welds and surfaces to be welded on angle iron, pipe or other structural materials.

BLENDS, FINISHES

Surface irregularities such as fins, flashings, pattern marks and other deburring jobs on practically any ferrous or non-ferrous material.

CLEANS, SMOOTHS

Steel plate, removing mill scale and smoothing down rough, flame-cut edges.

ROUGH and FINISH *with the same wheel!*

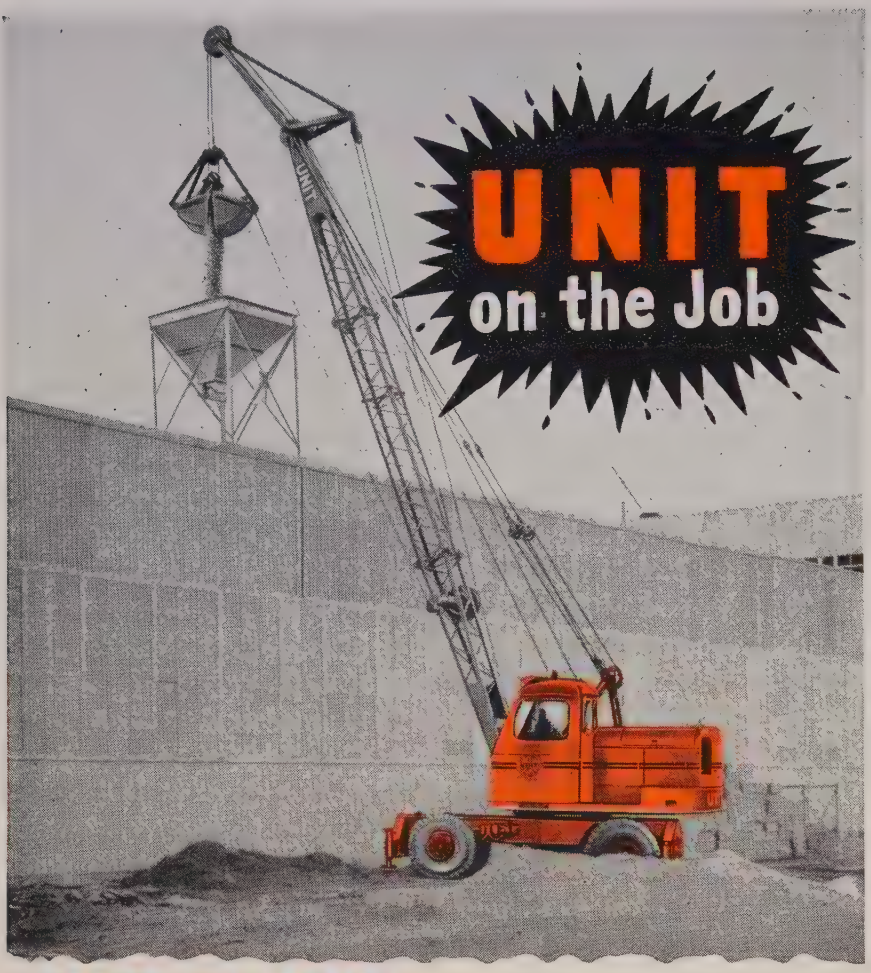
Everyone likes Bayflex! The operators because of its light weight, resilient cutting action, ease of use and safety factor . . . the management because it's economical to buy and use and is readily adaptable to so many jobs. Try the Bayflex way; the easy, modern way to accomplish your portable grinding jobs.

ask for a demonstration on your work

BAY STATE ABRASIVE PRODUCTS CO.
Westboro, Massachusetts, U.S.A.

Branch Offices and Warehouses —
Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All Principal Cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

BAY STATE



EASIER and FASTER! Unit 357 Mobile Crane Eliminates Stationary Elevators . . . Saves Man Hours on Factory Roofing Job.

Primarily this roofing job would require the erection of a scaffold-type elevator to hoist wheelbarrow loads of slag pebbles, plus a crew of men to load and unload the wheelbarrows. This means loss of setup time and duplication of handling. Now, with a UNIT 357, you drive up to the job — hoist the storage hopper to the roof — fill the hopper and the job is started. When insulation, roofing paper or other supplies are required, the UNIT 357 can move around the building to any location and hoist the material right on the spot where it's going to be used. Mr. Contractor, compare these two methods of material handling. Turn your lost time into PROFITS with UNIT.

Get the facts — Write for literature.

UNIT CRANE & SHOVEL CORPORATION
6521 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

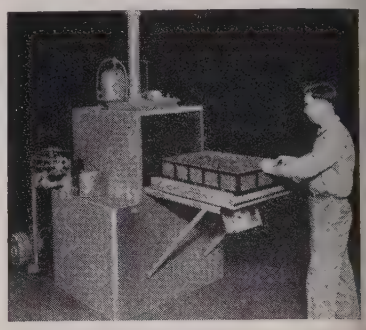
UNIT

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

A 7479-⅔-C

It completely eliminates secondary washing and extra work-handling by employing automatic surface spray skim-off. The manufacturer



reports metallurgically clean results are accomplished with 50-per cent time saving.

Welded steel units are available in load capacities of 300, 400 and 700 pounds. Circulation and solution skim-off cycles are controlled automatically by timer settings on the control panel. Ipsen Industries Inc., Dept. ST, 715 S. Main St., Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

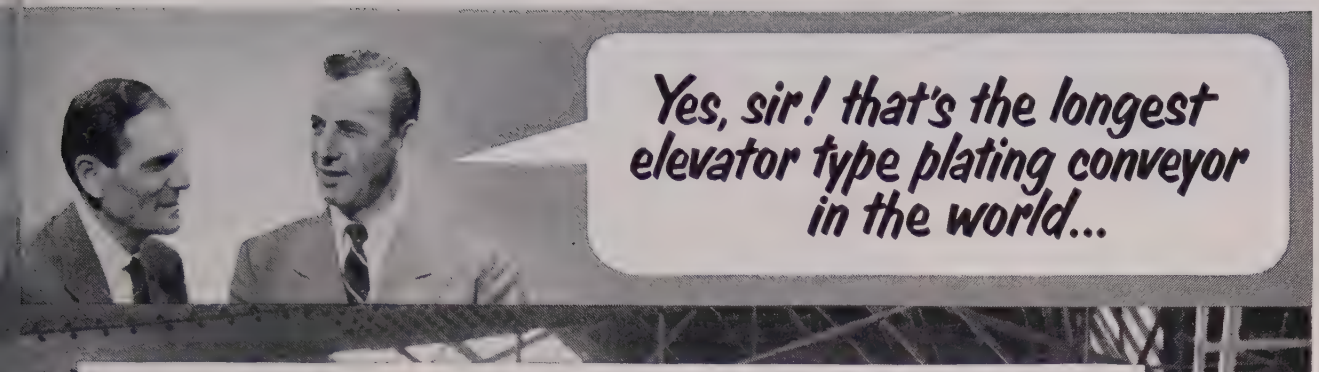
Typewriter-Size Copier

. . . rapid multiple reproduction

Three or more copies can be made from a single matrix sheet with this office machine designed for rapid production of multiple copies of letter-size papers. Copies are same-size, black-on-white duplicates of the original material and are ready for use immediately. One photo-exact copy can be obtained in about 50 seconds, three copies in 60 seconds. Copies are long-lasting, legible, and can be used for

reference, written on, mailed or filed. They can be made from practically any typed, written, drawn or printed original through the 8½ × 11-inch size. Eastman Kodak Co. Dept. ST, 343 State St., Rochester 4, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

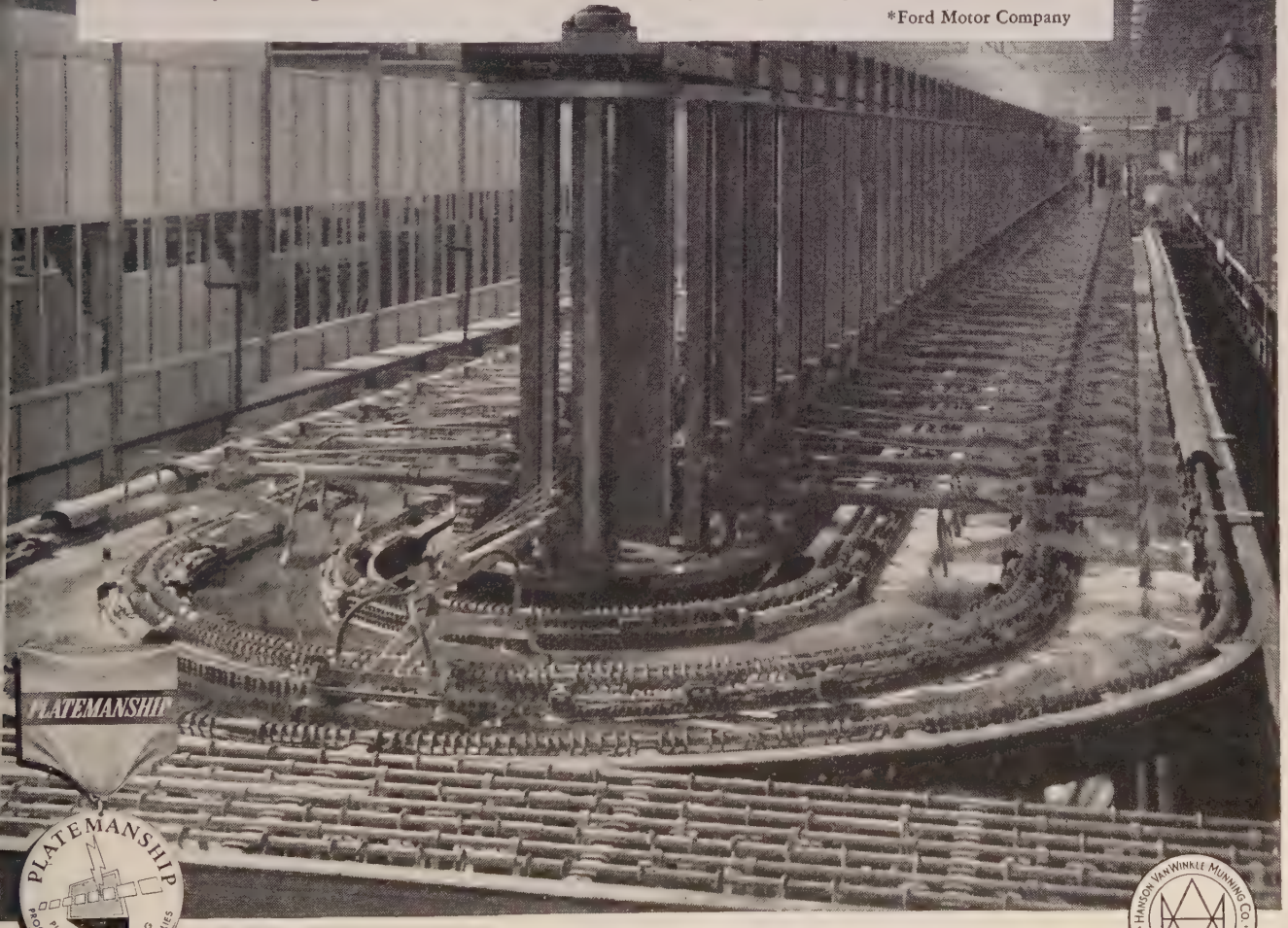


Yes, sir! that's the longest elevator type plating conveyor in the world...

When this customer* wanted a plating conveyor, he called in H-VW-M. You see, all H-VW-M conveyors are custom-engineered to fit the installation—every one is designed to solve a given production problem—no matter how large or small. They're built to handle a wide range of weight, current loads and lifts. Special features? Whatever the job requires. For example: delayed set-down for varying immersion time, treatment by-pass mechanisms, agitation—rack, air and solution, individual electrical control for each rack, and many others. This flexibility of design makes H-VW-M conveyors adaptable for practically any treatment cycle. They are now in operation for all types of plating as well as anodizing, pickling, cleaning, phosphate coatings, bright dipping, painting, etching, etc.

Full-automatic conveyors are but one of the many results of over eighty years of constant electroplating development . . . a continuous policy summed up in H-VW-M's Platemanship—your working guarantee of the best that industry has to offer, not only in plating conveyors, but in every phase of plating and polishing.

*Ford Motor Company



PLATEMANSHIP
PLATING & POLISHING PROCESSES • EQUIPMENT • SUPPLIES

Write for Bulletin FA-103 for complete information on H-VW-M Full Automatic Conveyors.

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our H-VW-M combination—
the most modern testing
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of over 80 years experience
every phase of plating and
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DUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

Saved: $54,000 per year...

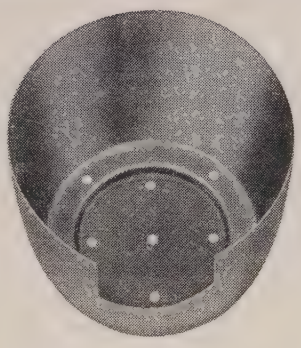
by converting

from castings

Casting $1.07

to

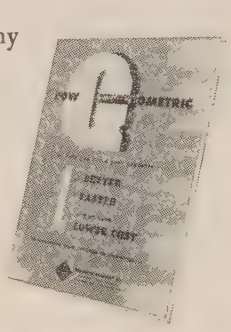
GEOMETRIC STAMPINGS



Stamping 57c

A large New England manufacturer called in Geometric engineers to study casting components of a new home appliance product. As a result the main casting shown above was converted to a stamping. Cost of the casting was $1.07, cost of the stamping only 57c—a savings of 50c on each part—or $54,000 saved per year.

If cost reductions like this make sense to you why not call in Geometric *now*—the earlier the better. There's no obligation and you may find substantial hidden profits—by converting from castings to Geometric Stampings.

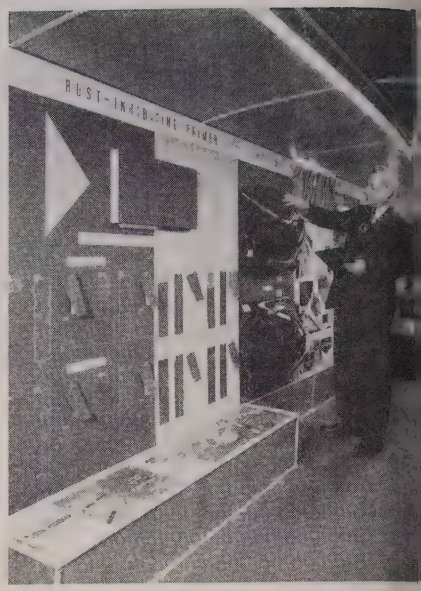


Send for free booklet on Converting from Castings to Stampings

GEOMETRIC STAMPING CO.

A Subsidiary of Barium Steel Corp.

1130 E. 200th Street Cleveland 17, Ohio



Traveling Lacquer Lab

This mobile lacquer information center will be used by Hercules Powder Co., Wilmington, Del., to illustrate industrial developments and improvements in lacquer raw materials. The trailer-housed exhibit hit the road recently completely fitted out as a traveling display and information lab. Rust-resisting primers for military items are among panel displays

Relay Application Described

Application and design information about the recently introduced type N control relay is available in booklet form from Westinghouse Electric Corp., Pittsburgh. Designed for remote control operation, this relay is used to sequence multimotor machines, operate solenoids and obtain pilot control from pushbutton stations of electrical circuits associated with such functions as temperature and pressure regulation. The type N has a 10-amp open rating, up to 600 amps six poles. It is available in any normally open—normally closed combination.

Herringbone Drives Cataloged

Information about Link-Belt Co.'s single, double and triple reduction enclosed herringbone gear drives is detailed in a 36-page book published by the company.

Herringbone gear drives are employed to transmit power at required speeds to conveyors, line shafts, blowers, hoists, machine tools and other industrial equipment. Installation photographs i

ok 2519 show examples of these ves in many types of heavy- y service.

Horsepower rating tables con- n several new ratios and ratings input speeds of 720 to 1750 n are cited for all drive sizes. mplete instructions for correct lection include new overhung d tables and a table listing load sses for 170 machine types. In , the book lists 39 sizes of drives 534 standard ratios from 2.84:1 326:1. Capacities range from to 2480 hp and output shaft eeds from 2.2 to 623 rpm.

STM Issues Brazing Specs

Brazing filler metal specifica- ns issued by American Welding ciety and American Society for sting Materials, cover every type brazing filler metal in common e today. The 33 different class- cations are divided into groups cording to principal constituents. ey include classifications for uminum-silicon, copper-phospho- us, silver, copper-gold, copper d copper-zinc, magnesium, and at-resisting filler metals.

Specifications, as usual, include n appendix giving helpful infor- ation for selecting the brazing etal best suited for a given ap- ication. Among factors included e brazing temperature range for ach classification, color of joint btained, recommended joint de- gns and an explanation of some ndamental concepts of brazing at previously have been misun- erstood.

Copies can be obtained at 40 nts each from AWS, 33 W. 39th t., New York 18, or ASTM, 1916 ace St., Philadelphia 3.

urnace Keeps Forging Pace

Automatic rotary hearth furnace pplied to continuous forging sys- ems is the subject of a pamphlet ublished by George J. Hagen Co. he pamphlet presents a complete tory of an actual continuous forg- ng system.

Featured is a 30-foot diameter, oughnut-type automatic rotary earth furnace that automatically eats sheared billets and supplies em on a continuous basis to the rging production line. Copies are vailable from the company, 2402 . Carson St., Pittsburgh 3.

ELECTRO *Extra* DYNAMIC *Dependable*

INDUSTRIAL MOTORS

Every Electro Dynamic motor is built with

EXTRA INSULATION in stator slots and between phases
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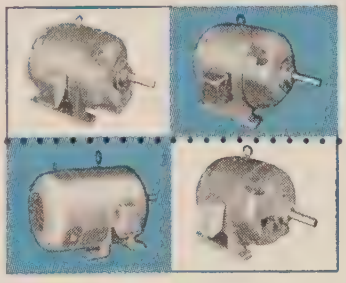
From 1 to 250 Horsepower (N. E. M. A. STANDARDS)

One-piece cast iron frames.

Extra large "free-flo" air channels.



Permanently aligned cast iron brackets.

Liberal size grease lubricated bearings.

Also a complete line of Direct Current motors and generators

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DIVISION OF GENERAL DYNAMICS CORPORATION
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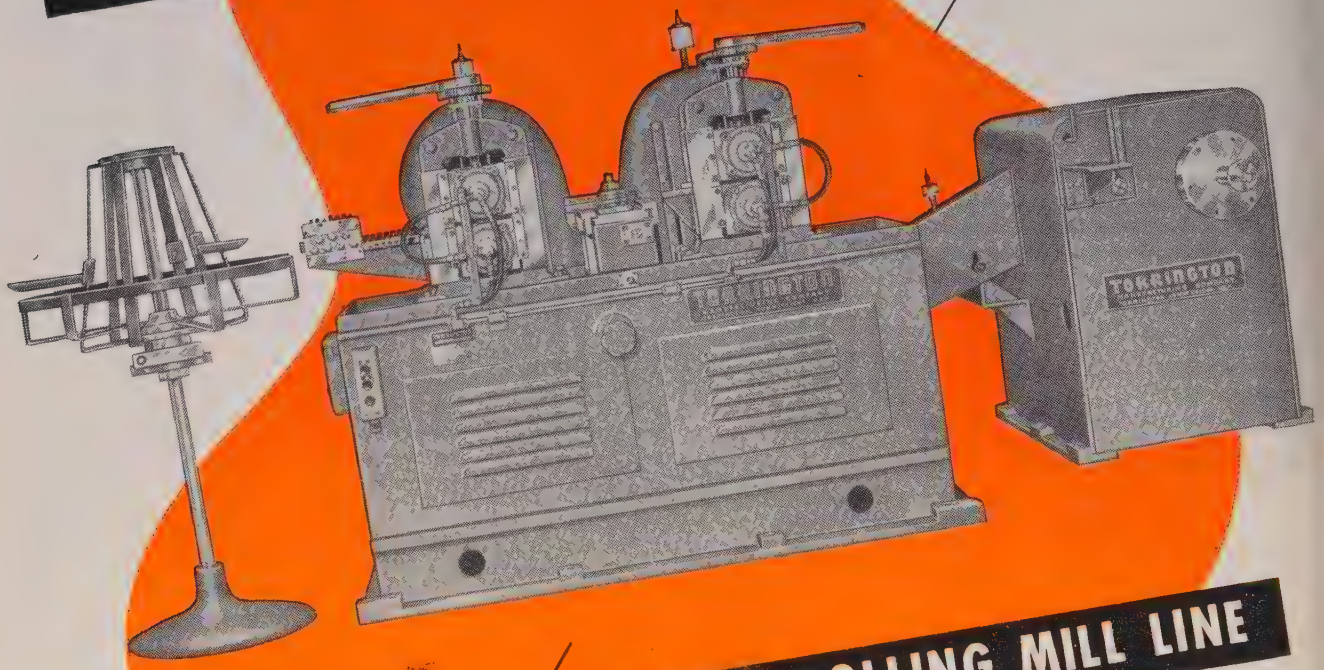
VERSATILE!

COMPLETELY NEW!

FOR SMALL WIRE!



TORRINGTON'S 2-STAND FLAT WIRE ROLLING MILL LINE

SIX-STAGE LINE

1. Start with round wire in coils on pay-off 2. on thru 2-plane straightener 3. then thru first flattening rolls 4. and edging rolls 5. on to second flattening rolls 6. to winder where finished coils are formed

- Readily adjustable for large variety of coils and spools
- Designed for easy maintenance — rolls can be removed and replaced in minutes
- Anti-friction bearings throughout
- Internal coolant circulation in flattening rolls

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TORRINGTON, CONNECTICUT

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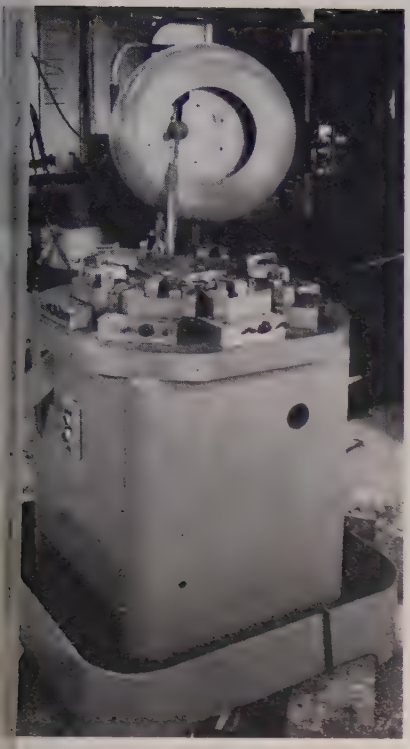
DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER SIXTY-FIVE YEARS



rsatile model 300 performs compa-
bly well on straight or tapered work

Rolling machine table top: Large number of pieces in work at one time makes possible the relatively slow die speed of 38 rpm, reducing wear

THREAD ROLLING:

19,440 Pieces per Hour

Hopper-fed pieces roll at close intervals with die speed held to 38 rpm to reduce wear and extend die life. Machine takes full metal range in hollow or solid work

)P AVERAGE of 19,440 pieces r hour makes low-cost threading production accomplishment. This the rate hit consistently by the llmaster model 300, a develop-ent of D. H. Prutton Co., Cleve-nd, on class three threads in ½-ch-13 hollow set screws, SAE 035 steel. The mark is propor-onately higher on smaller sizes. Indicating possibilities for appli-tions across the board is the fac-r of extreme versatility. Reports dicate the machine performs com-arably on hollow or solid work, traight or tapered, and takes a omplete range of metals—from onferrous through aluminum and agnesium, to hardened and stain-ss steels.

Planetary Die—Key to the roll-g machine's high-geared output a design principle termed the anetary die. This is a develop-ent that serves to reduce thread lling pressure radically by dis-ibuting it over the full 30-inch rcular die length. The effect is imination of excess pressure, fre-uently a cause of distorting or ushing hollow parts.

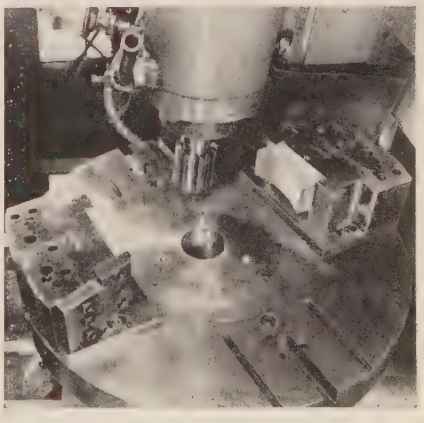
The so-called planetary design ight be likened to a golf ball washer placed on the horizontal. Hopper-fed pieces roll at close intervals around the circumference. The large number of pieces in work at one time make possible die speeds of 38 rpm. This relatively slow speed reduces wear and gains proportionate extension of die life. No shock is experienced at infeeding.

Production Records—In one installation, the firm reports the model 300 turns out spark plug shells at a rate of almost twenty to one over the old rolling method —or approximately 20,000 compared with the previous 1200 per hour. In a similar installation, speedometer worms are rolled on a solid shaft at the same ratio.

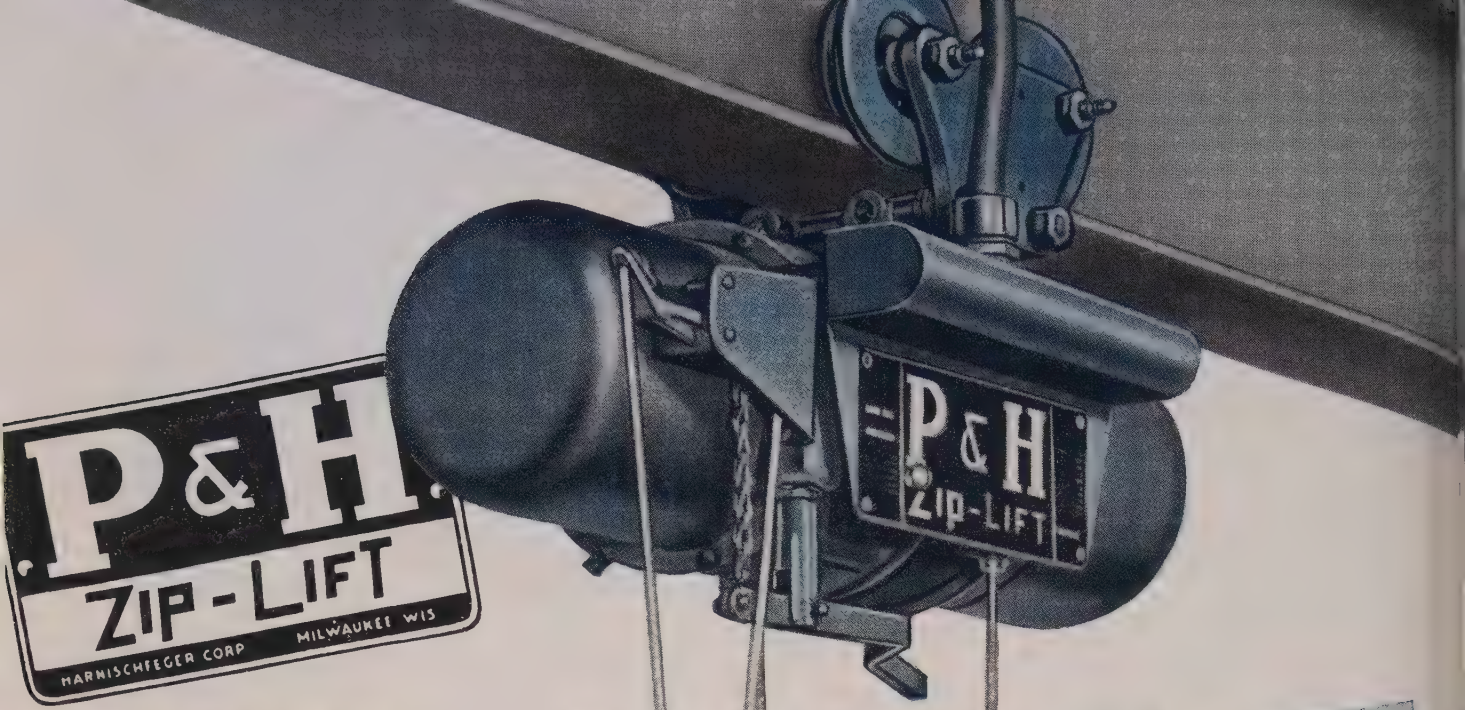
Dies employed are low carbon, high chrome. Rockwell-C 59-61 is used on standard threads; 63-65 on stainless. The company reports it has available all U.S. standard die sizes and pitches. Off the record of early performance, the firm says a user can expect to spend between 1 and 1½ hours on each die change.

Special Milling Machine—Prutton designed and built its own machine to do the die milling job required. This machine is the factor that makes the whole setup succeed. Its operation so impressed one machine tool builder that the latter contracted to build it on a production basis.

Dies are cut to a tolerance of 0.0015-inch. Thus, class three is about the smallest that can be met under production conditions. Actual die life is still a subject of conjecture because none has worn out. On the basis of pilot performance, the company's projections range from 15 to 20 million pieces.



Form cutter on the Prutton-designed thread miller is seen above. Relationship of dies on the miller is the same as it is in thread roller



NOW—A NEW "ZIP"

WITH ROPE CONTROL*

ONLY $199.50

Now, for the first time, the famous Zip-Lift Electric Hoist at the amazing low price of *only* $199.50. It's a genuine Zip-Lift . . . with all the solid quality you expect from P&H. The same preferred P&H engineering! The same fine P&H construction! *And* — a unique, new rope control designed for fast "one-hand" hand operation. It's the big bargain today in small hoists. It's ready to work and save for you!

The Zip-Lift frees skilled hands for more productive work. No more valuable time lost hustling heavy loads manually! P&H "Thru-the-Air" handling makes production costs tumble.

Call your nearest P&H dealer and have him tell you about the latest handling ideas. He'll show you where and how the Zip-Lift will cut costs for you!

Users! Dealers!

Visit the P&H Exhibit at the Materials Handling Show in Philadelphia Space 1509—1513—1515, May 18-22.

See the new P&H Zip-Lift in action! It's the high quality, low-cost *electric wire rope hoist* you've been waiting for!

PUSH BUTTON CONTROL ALSO AVAILABLE AS OPTIONAL EQUIPMENT. *

P&H HOIST DIVISION
HARNISCHFEGER CORPORATION
Milwaukee 46, Wisconsin

ıcuum Forming Grows

Method of forming thermoplas- ic sheets is proving cheaper ınd more versatile

CUUM forming, long antici- ed as a process to make eco- mical the forming of thermo- stic sheets, is now on the oduction line as a result of new lchines developed by Auto-Vac ., Fairfield, Conn. The method proving faster, cheaper, and re versatile than older methods, d as a consequence is growing adily in popularity. Whereas in 50 there were three companies th twelve vacuum forming ma- ines, today there are 75 compan- with 150 machines in opera- n.

History and Development—At e start of the Korean cam- ign, preprinted plastic sheets re formed into relief maps by e process. Results were excel- nt but the process was far too pensive for general use. How- er, the possibilities suggested by e maps encouraged experimenta- on which has now widened the ld of application to include ys, decorative embossing, indus- ial components such as washing achine lids and television and dio cabinets, lighting fixtures, nd packaging for Army supplies nd consumer goods.

Vacuum forming consists of eating a plastic sheet clamped er a mold. After a controlled eating, vacuum is released, rapid- evacuating the chamber formed etween the sheet and the single- e mold. On cooling, the sheet gains its rigidity and an essenti- ly finished product is removed om the mold.

Cheaper Decoration — Preprint- ng of the sheet by-passes the ostly and tedious process of mask- ng, unmasking, and remasking for pray painting or the even more ostly application of color by brush ainting. By the old methods of ecorating, ten of the forty cents costs to produce a piece might o for painting; preprinting chieves as good or better results r one cent.

Versatility of vacuum forming not limited to the products to hich it can be applied, but ex- nds to the materials which can be treated by the method as well as to the size of the sheet to be molded. Polystyrene, modified styrenes, polyethylene, acetate, butyrate, and all vinyl polymers have been successfully shaped by vacuum forming.

By controlling the heat, materials varying in thickness from 0.001 inch to 0.125 inch can be formed without noticeably affecting the basic strength of the material. Therefore, it is possible to design parts which must later be machined or resist stresses.

Cleats Stop Belt Slippage

To solve the problem of slippage of 50-pound paper bags of mineral wool insulation on an inclined smooth-surface belt conveyor, Baldwin-Hill Co., Trenton, N. J., came up with a solution involving another Trenton concern.

After the mineral wool is bagged, it is placed on a belt conveyor which takes the paper bags up a 33 degree incline to the shipping department. The 30-inch wide belt has a smooth surface. Baldwin-Hill tried cementing rubber cleats cut from old belt remnants to the belt to stop sliding. The cleats came off.

So they bought some Ruff-Top conveyor belt from their neighbor in Trenton, the Thermoid Co. But they didn't use it as a belt, they cut it into cleats 3½ x 11 inches and bolted the cleats to the existing belt every 48 inches on the 30-foot long (center to center pulleys) belt.

Twin Belts Double Grind Rate

Two coated abrasive belts, running over vertically opposed contact wheels, doubled the production finishing rate of carpenter squares for one midwest manufacturer. This setup permitted both sides of the flat metal product to be ground at once.

Previously, the squares were off-hand polished on abrasive coated setup wheels. The original objective in converting from setup wheels to coated abrasive belts was to take advantage of the better finish produced and the reduced cost in operation possible with belts. The double belt machine was a subsequent development.

The machine, as first set up by

HANDLE IT "THRU-THE-AIR" with P&H ZIP-LIFT AT STILL LOWER COST!

Now Have These Advantages

Wire Rope Hoisting!
No troublesome chains, no hidden weaknesses, no dangling loops to tangle or get in the way. Free, easy handling and wider range of side pull with wire rope hoisting.

25% Overload Capacity!
This extra safety factor reveals more fine P&H engineering — and overload margin up to one-fourth above rated capacity during intermittent usage.

Extra Quality Features!
Double brakes for greater safety — Fully enclosed construction — Lasting drive mechanism — Mechanism operating in oil for longer life — Improved easy-working load block.

Call your P&H Dealer

P&H HOIST DIVISION
HARNISCHFEGER CORPORATION
Milwaukee 46, Wisconsin

the product engineers of Behr-Manning Corp., Troy, N. Y., manufacturer of coated abrasives, consists of two coated abrasive belt grinders mounted in one frame and driven by one electric motor. The bottom belt runs vertically and the top belt runs horizontally. Rubber rimmed contact wheels support the belts where they contact the work and act as belt drive wheels. Two backstand idler pulleys, one in the frame base and one on the rear frame, maintain belt tension.

Center distance between the two contact wheels is fixed to maintain a gap between opposed abrasive belts equal to the final desired thickness of the square. However, the frame is adjustable to permit changes in center distance for grinding thicker or thinner stock.

Printed Circuits Promise Savings

Prefabricated circuits promise great savings in the production of low power apparatus such as radio, television, hearing aids, automatic signals and other electronic devices. The new method has untold possibilities, Norma A. Skow, director of research an development of the Synthane Corp Oaks, Pa., told a meeting of th American Society of Mechanic Engineers in Columbus, O.

A printed circuit is a metal r production of a conductor patter which has been bonded to an i sulated material, Mr. Skow e plained. Serving as a conductin medium in electronic assemblie such circuits replace to a large e tent the internal maze of wiri normally found.

Printed circuits have bee achieved by plating metal pattern on plastic boards, by sprayin metal into depressions in a plast plate, by bonding rigid wiring har ess to a plastic base, by fusin silver ink patterns on ceramic or by etching of metal-clad plastic The latter method is currentl gaining in popularity and seem to be especially suited to mas production assembly procedures r quired in the highly competitiv electronics industry.

Machine Design Aid

New book gives information o the selection and application o motors and controls for machin tools. "Machine Tool Electri Handbook" serves as an electrica guide for the design engineer.

Three major divisions in th handbook cover motors, contro and services. The divisions o motors and controls are divide into sections, each identified b number for quick reference.

Performance data, application in formation and many other feature are described which will influenc the selection of equipment for ma chine performance. Requests fo copies should be made on compan letterhead and title of request should be given. Address is In dustrial Department, Westinghou Electric Corp., Pittsburgh 30.

Aluminum OK For Transformers

Distribution transformers wit aluminum windings can be bui with approximately the sam characteristics as the present co per designs, say officials of th General Electric Co.'s Distributio Transformer Department.

This will enable the company meet customers' needs if there

READY TO ROLL...

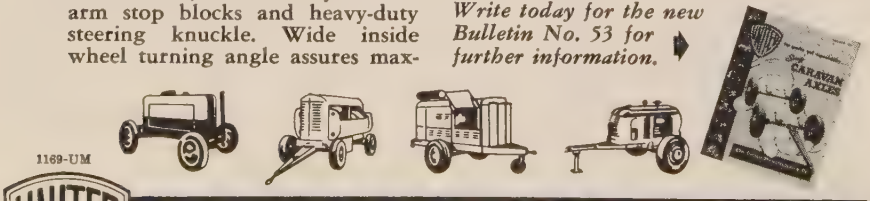
...ON CARAVAN AXLES

Rutted ground or high grade highway . . . equipment mounted on CARAVAN axles is ready to roll over any surface. These quality-built assemblies assure positive trail at high speeds as well as stability for the heaviest equipment over the roughest ground.

CARAVAN axles feature double-acting spring cushioned draw bar to minimize stopping and starting shock, sturdy solid steel axle beam construction, extra-heavy center arm stop blocks and heavy-duty steering knuckle. Wide inside wheel turning angle assures maximum maneuverability and eliminates jack-knifing.

CARAVAN units are available as single-axle two-wheel assemblies and as four-wheel running gear equipped with automotive type steering. They are recommended for mounting military and industrial equipment as well as field service and construction machinery weighing up to 14,000 lbs.

Write today for the new Bulletin No. 53 for further information.



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Outstanding service over the years has won for TORRINGTON Heavy Duty Needle Bearings the confidence of machinery builders and users in every major industry.

Today you will find these rugged TORRINGTON Bearings giving free-rolling, low-maintenance service in equipment ranging from traveling cranes to rolling mills, oil well pumping units to machine tools, printing presses to auxiliary paper-machine equipment.

6 reasons why TORRINGTON *Heavy Duty* Needle Bearings will serve you better...

1 The one-piece outer race and inner race are manufactured from carburizing-grade nickel steel. Harder surfaces offer better resistance to wear; tough cores stand up under shock.

2 Their accurately ground raceway and side flange surfaces eliminate drag at the point of roller contact. Rollers operate in a true path.

3 The stainless steel retaining bands are spot welded into position. They give positive roller retention and form an internal lubricant reservoir while resisting the entry of foreign matter to the rolling elements.

4 The lubrication groove in the outer race and oil holes in both inner and outer races permit easy, effective lubrication from a drilled hole in the housing.

5 The large-fillet trunnion ends increase roller strength and present to the ground, well-lubricated side flanges a larger, more wear-resistant area.

6 Full complement of rollers assures maximum load carrying capacity.

Specify TORRINGTON Heavy Duty Needle Bearings!

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TORRINGTON *HEAVY DUTY NEEDLE* **BEARINGS**

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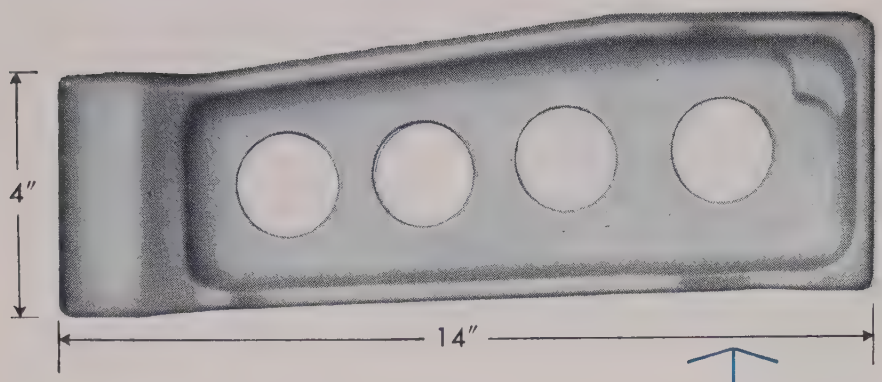

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to Gas Range Burners

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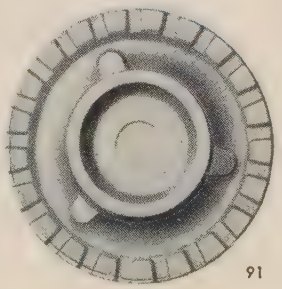
Aluminum Forgings Save Weight, Save Finishing Time and Provide the Same Strength as Steel

If weight and strength are important factors in your product, then Mueller Brass Co. forged aluminum parts may be your best bet. Mueller aluminum forgings weigh only ⅓ as much as steel, yet they are approximately as strong. They make ideal parts for many applications and they are particularly desirable as parts for high speed rotating and oscillating machines because they reduce vibration and bearing loads, thus causing less wear on other parts. They possess good dimensional stability and retain their mechanical properties at high speeds and reasonable temperatures. The smooth, bright surfaces save machining time and eliminate costly finishing. Mueller Brass Co. can forge aluminum parts to your specifications in any practical size and shape from any of the standard or special alloys. Write us today for complete information.



MUELLER BRASS CO.
PORT HURON 19, MICHIGAN

91

any future shortage of copper c a marked increase in its price, com pared to aluminum, they say.

In spite of the lower conduc tivity of aluminum and increase manufacturing problems, distribu tion transformers in a number c ratings have been produced usin aluminum windings with the ove all weight, dimensions and electric al characteristics practically iden tical to copper transformers.

The company does not plan t shift to the use of aluminum a this time, Mr. Smith emphasized However, several hunderd develop ment and production transformer with aluminum windings have bee built in sizes 5 to 333 kva fo voltage classes of 15,000 volts an less. Many of these transformer are now operating on customers lines and plans are to continue small experimental production.

Big Aluminum Extruder Built

A 1250-ton long stroke alumi num extrusion press manufacture by The Watson-Stillman Co., Divi sion of H. K. Porter Co. Inc., Ro selle, N. J., incorporates the lates design features and is capable o handling billets up to 24 inches i length. It is hydraulically oper ated, four column type, equippe with Oilgear radial piston pumps

The long stroke design of th main cylinder permits loading bi let and dummy block into th container on a single forwar stroke of the main ram. The ra moves at the rate of 8 inches pe second and loads a 24-inch bille and dummy block in four seconds

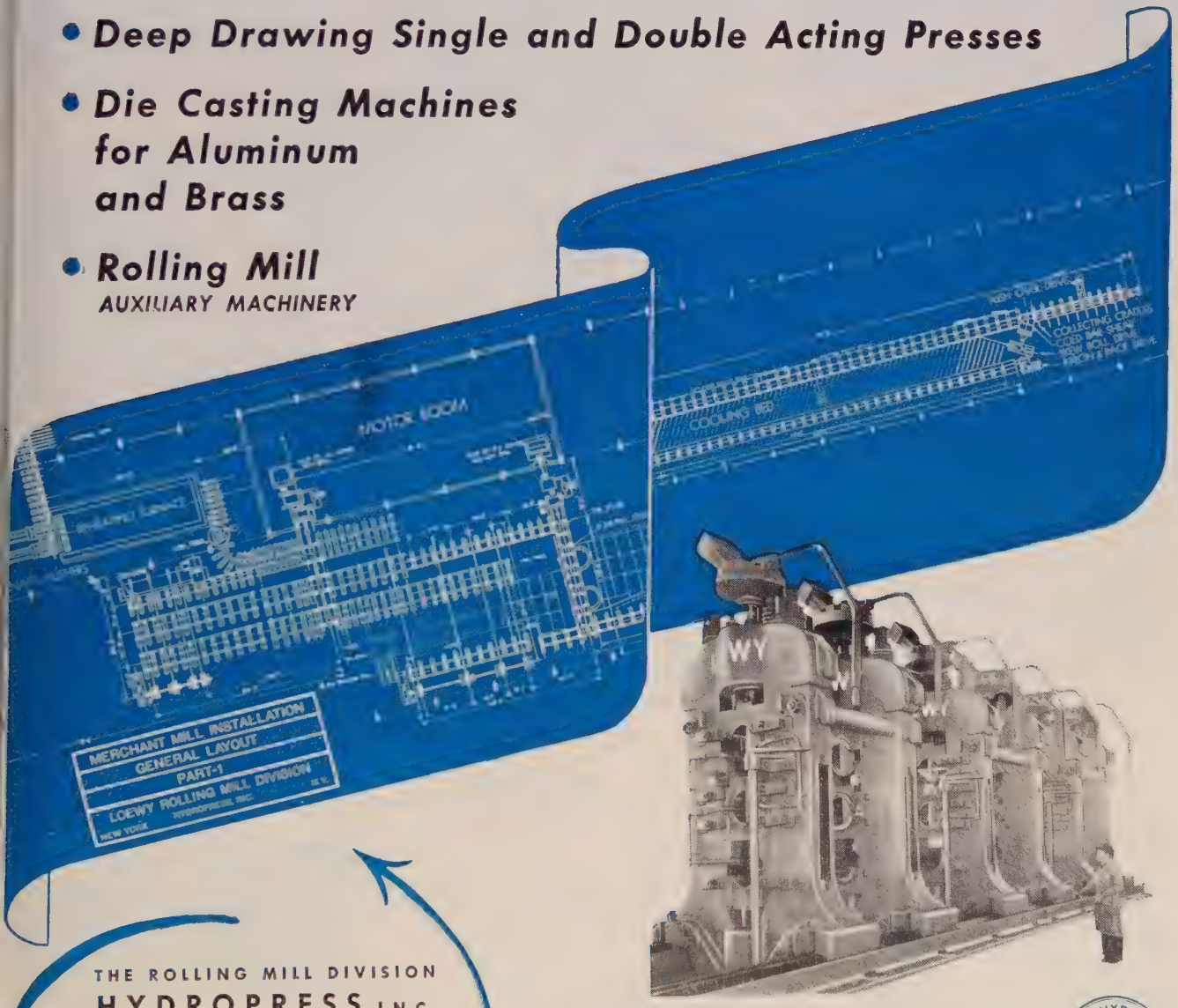
Tailpipe Pads: 120 per Hour

Five operations completed at rate of 120 pieces per hour, an at 100 per cent efficiency, are per formed on tail pipe pads by a spe cial machine built by Cross Co. Detroit. The machine mills, bores drills, chamfers and taps the ex haust manifold pads for 6-cylinde engines.

Parts are held on a fluidmoto driven index table with six sta tions—one for loading and unload ing and one for each of the fiv operations. Other features includ hardened and ground ways, hy draulic feed and rapid travers individual lead screw feed for tap ping and automatic lubrication.

We Build Complete Rolling Mill Installations

- **Hot and Cold Rolling Mills for Ferrous and Non-Ferrous Metals** SHEARS, LEVELLERS, STRAIGHTENERS, COILERS, ETC.
- **Extrusion Plants for Steel** AND NON-FERROUS METALS
- **Forging and Die Forging Plants**
- **Deep Drawing Single and Double Acting Presses**
- **Die Casting Machines for Aluminum and Brass**
- **Rolling Mill** AUXILIARY MACHINERY



THE ROLLING MILL DIVISION
HYDROPRESS INC.
will put into operation in 1953 a steel mill installation for the National Shipyards and Steel Corporation in Manila

LOEWY ROLLING MILL DIVISION

HYDROPRESS INC.
ENGINEERS & CONTRACTORS

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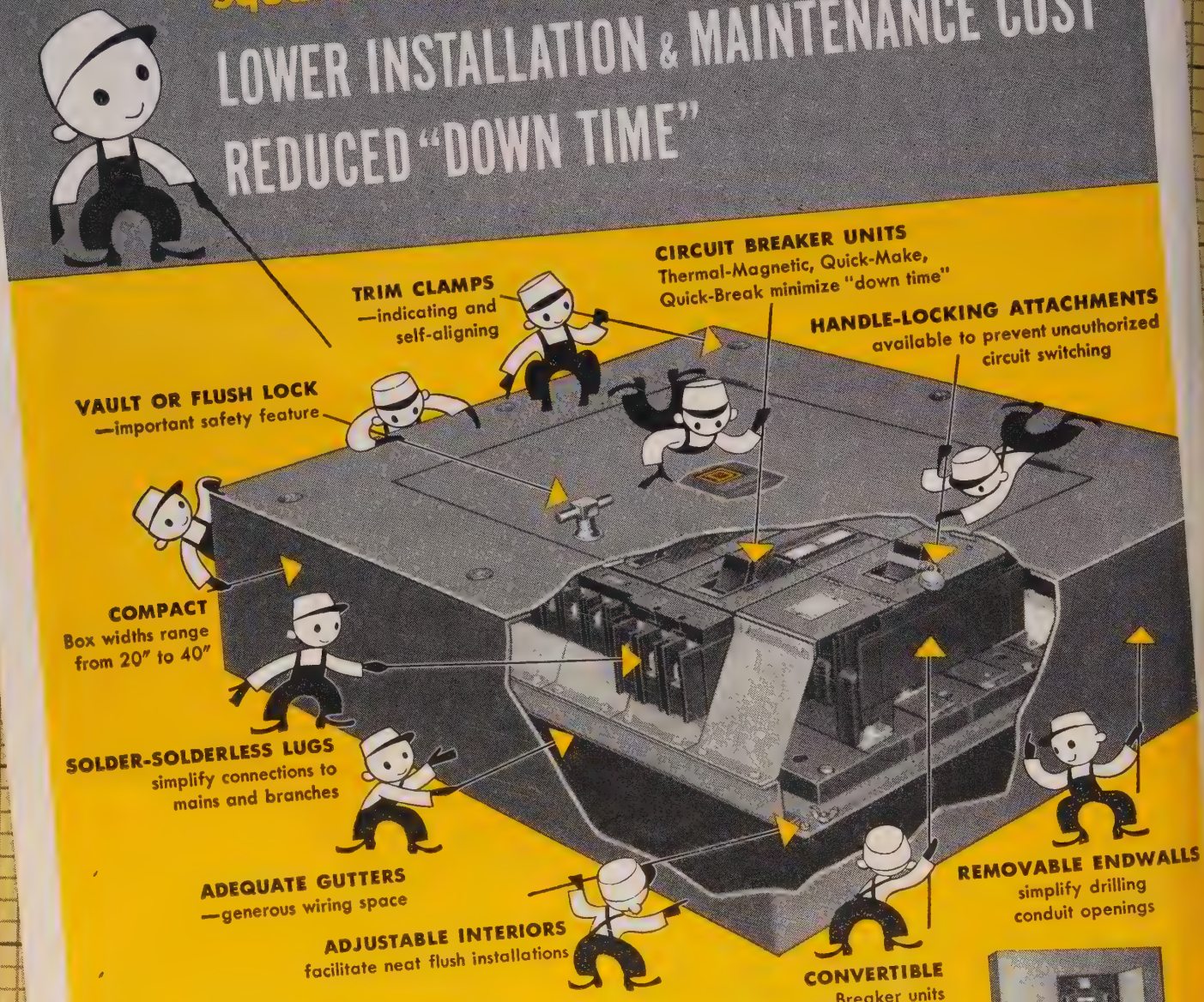
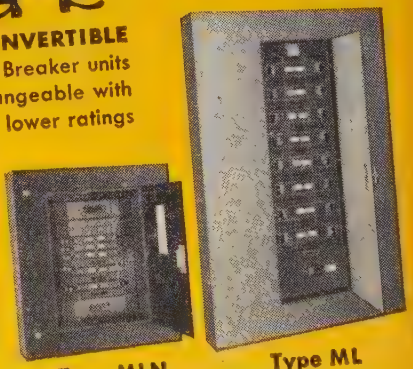
LOWER INSTALLATION & MAINTENANCE COST
REDUCED "DOWN TIME"



SQUARE D's TYPE ML CIRCUIT BREAKER DISTRIBUTION PANELBOARDS

provide complete, 2-way protection through the use of thermal-magnetic breaker units. Costly "down time" is held to a minimum since circuit breakers can be reset quickly after the fault has been cleared.

Four circuit breaker frame sizes provide ratings ranging from 15 to 600 amperes, 250 or 600 volts.



Type MLN Type ML

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

1903 • **50** YEARS OF DESIGN LEADERSHIP • 1953

st step in manufacture of truck s is the shaping and forming of e steel bands. Truckload of bands, pictured, is received in this m when delivered from suppliers

Ends are joined by welding after the coin stamping and shearing operations have stamped the identifying marks on the rim and sheared off the ends to present a near-circular rim shape

Pneumatic tool is used in chipping the excess weld from the circular steel band. The rim then goes to a weld tester which exerts pressures far in excess of any road stresses

Rimming THE NATION'S TRUCKS

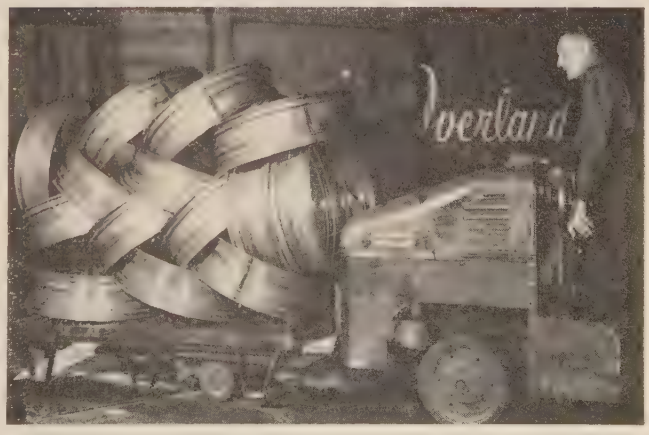
Fabricating the wide-base steel rims for trucks and busses is big business in Akron. They're lighter and stronger and help stretch operating life of tires

If the weld is perfect, rims are put into this shrinking machine and forced back into correct size and shape. After shrinking, they are inspected for size and quality

VIDE BASE rim program for the truck and bus ndustry was introduced before World War II and as added substantially to the operating life of truck res. Much of the pioneering work in wide base ms took place at Goodyear Tire & Rubber Co.'s m plant in Akron, O.

Taking steel bands as received from the mill, this lant shapes and welds them into more than 130 different types and sizes of rims. In addition to heavy olume of truck and bus rims, Goodyear manufactures rims for earthmover equipment—a new field hat has developed rims of 16 different sizes ranging from 375 to 700 pounds as compared with the op weight of 75 pounds for truck rims. Some tand 32 inches in diameter with widths to 22 inches nd capable of handling 36-ply tires.

Construction of the heavy earthmover rims is usuly of plate steel and special steel sections, while ractor rims take rolled strip and plate steel.



A load of finished rims goes into a box car for shipment. Ordinarily rims are galvanized, but these are left bare as they are to be painted by the customer

Standard Conveyors can speed operations

Keeping things moving — avoiding "bottle-necks" — on production, assembly, processing or packaging lines can be done better, faster, and cheaper *mechanically* with conveyors.

Your needs in conveyors — ranging from power and gravity conveyors, roller, belt, slat, chain, push-bar, sectional — to portable, self-contained conveyors — spiral chutes — pneumatic tube systems — can be met at Standard, with a conveyor experience record of more than 45 years. Write — Address Dept. ST-53.

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General Offices: North St. Paul, Minnesota
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Write Dept. ST-53 for Standard's General Catalog and tell us what you want to convey.

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ROLLER • BELT • SLAT • CHAIN • WHEEL
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INCLINEBELT • LEVEL BELT • EXTENDOVEYOR
UTILITY BELT-VEYOR • HANDI-DRIVE
VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

New Books

Tooling Information

MACHINE SHOP TOOLING, by Charles C. Williams; paper covered, 342 pages, 4½ x 6½ inches; published by Wilco Press, Philadelphia, for $3.00.

Written for the man at the machine, this book has all information alphabetized for quick reference. It assumes that the operator knows his job and does not waste space on unnecessary details concerning running of the machine, mounting setups, etc. It is comprehensive, containing all data on materials, tool angles, lubrication, feeds and speeds required in the average shop. The book contains specific answers to specific tooling and machining problems.

Data was supplied by over fifty manufacturers of tools and materials. These companies are listed in the book.

Covers the Steel Industry

WATKINS CYCLOPEDIA OF THE STEEL INDUSTRY; cloth, 478 pages, 8½ x 11½ inches; published by Steel Publications Inc., Pittsburgh, for $10; available from STEEL, Penton Bldg., Cleveland 13, O.

In the fourth edition of this reference work devoted to the steel industry, chapter headings similar to previous editions are carried, but the information has been revised to keep it up to date. The material is written for this edition by authors selected for their competence in their particular field.

Chapter headings include: Steel industry; coal and coke; iron ore; manufacture of iron; steel melting processes; rolling and shaping of steel; carbon and alloy steels; forging, forming and finishing of steel; joining of steel; heating treatment of steel.

A buyers' guide of equipment manufacturers is also included in the book.

How to Read Blueprints

SIMPLE BLUEPRINT READING WITH SPECIAL REFERENCE TO WELDING AND WELDING SYSTEMS; cloth, 207 pages, 5½ x 8½ inches; published by Lincoln Electric Co., Cleveland, for $1.00 in U.S.A., $1.50 elsewhere.

This fourth edition contains new information, more drawings and photographs than previous editions. All symbols and other data have been revised to bring them up to date. It is intended as a guide to a clear understanding of blueprints and how to use them in mechanical fabrication and construction.

Using a simple welded base as a

An Example

OF MASS PRODUCTION METAL-WORKING MACHINERY

By Waterbury Farrel

This group of "WATERBURY" Solid Die Double Stroke Headers is in operation at the Blake and Johnson Company, Waterville, Connecticut. Production rate per machine approximately 150 headed blanks per minute.

Waterbury Farrel is a recognized leader in the production of cold process bolt and nut machinery.

Yet, this is only one of several broad classifications of metal-working machinery which have spread Waterbury Farrel's reputation throughout the world. As can be seen below, the company's century of design, engineering and production experience also includes a wide variety of Presses, Mill Machinery, Wire Making Equipment and Special Machinery.

For high speed, economical production of a vast range of metal products, industry looks to equipment by Waterbury Farrel.

WF-6

WATERBURY-FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL • *COLD PROCESS BOLT AND NUT MACHINERY*—Headers (all types) • Re-headers • Trimmers • Thread Rolling Machines • Slotters Nut Tappers, etc. *POWER PRESSES*—Crank, Cam and Toggle; also Rack and Pinion Presses • Multiple Plunger Presses • Hydraulic Presses, etc. *MILL MACHINERY*—Rolling Mills • Wire Flattening Mills • Chain Draw Benches • Slitters and various accessory mill machinery. *WIRE MILL EQUIPMENT*—Continuous Fine Wire Drawing Machines (Upright Cone and Tandem) • Bull Blocks • String-up Machines • Spoolers, etc.

FOUNDED WATERBURY FARREL 1851

study object an explanation is made in step-by-step fashion of how the sign language of blueprints is used to transmit information. After basic principles are explained, welding symbols and their use are fully described.

New Data on Metals

METAL DATA, by S. L. Hoyt; cloth, 526 pages; 7 x 10 inches; published by Reinhold Publishing Corp., New York, for $10; available from STEEL, Penton Bldg., Cleveland 13, O.

This new edition of the author's *Metals and Alloys Data Book* includes the most recent information available as well as much new data on topics such as hardenability on H-steels, the recently developed super alloys for high temperature stress members and other new alloys. The data selected from reliable sources are presented in a form usable for daily reference by metallurgists and engineers.

Most of the material is offered in at-a-glance tabular form with a minimum of descriptive text. Nearly 700 tables and graphs give working information on such metallic properties as tensile strength, hardenability, thermal expansion, creep strength, endurance limit and yield strengt at normal, subnormal and elevat temperatures, and for various co ditions of mechanical treatmer Other features include a listing commonly used test bars, hardne tests, corrosion data, conversi factors, applications of materials a properties of elements.

Survey of Manganese

MANGANESE MATERIALS SURVEY: pap cover, 541 pages, 7¾ x 10¼ inch available from Superintendent of Do ments, Washington 25, D. C.; for $4.2

This study was compiled for t Materials Office, National Securi Resources Board by the Unit States Department of the Interi Bureau of Mines. A definition a description of manganese and its or are contained in the first chapte Other chapters deal with world-wi reserves in general and cover spe ifications of manganese ores for va ious uses.

The mechanics of stockpiling, o treatment and metallurigal refini processes are described. United Stat manganese deposits are discussed well as the natural deposits by ge graphical areas. Secondary mang nese sources and ore recovery a also included. World trade a United States tariffs are covered two chapters.

The study describes various us of manganese and a description of t industry, consumers, producers a processors. A historical survey manganese through both World Wa is included. The final chapter pr sents a series of business statisti

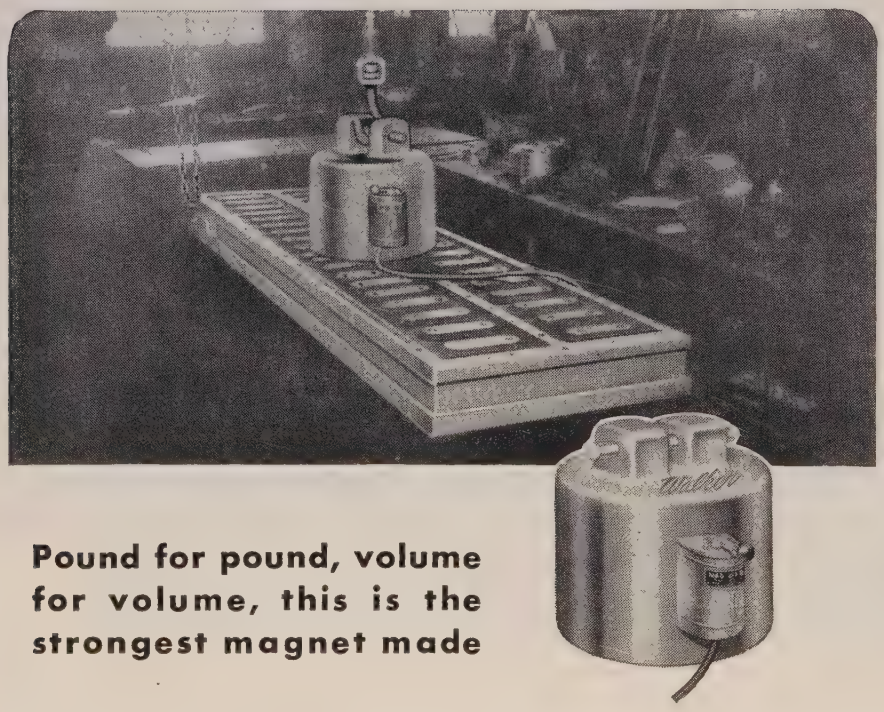
Brazing in Metal Fabrication

INDUSTRIAL BRAZING, by H. R. Brook and E. V. Beatson; cloth, 344 pages, 5 x 8½ inches; published by Iliffe & So Ltd., London, England, for $7.50; ava able from British Book Centre Inc., Ne York 22, N. Y.

This is an authoritative study brazing as a process for metal fa rication. It covers in detail all mo ern brazing methods: Torch, fu nace, high frequency induction, r sistance, salt bath and dip. Speci considerations necessary in work aluminum, stainless steels, berylliu copper, cemented carbides and va uum tube construction are dea with separately.

A general introduction to the pro esses and equipment used is follow by a review of brazing materials a a complete summation of the knov factors governing joint design. O chapter discusses problems of sele ing the appropriate brazing proce for various types of work and met ods of inspection and testing.

Walker Does It Again-



Pound for pound, volume for volume, this is the strongest magnet made

WALKER MAGNETS—The utilization of magnetic force under the most efficient conditions is the outcome of Walker's more than fifty years of research and development. . . . The 12" diameter Walker lifting magnet shown holds work up to 3000 pounds.

The Walker material is high in permeability and magnetized to complete saturation with equal flux distribution. . . . The Walker line includes contoured lifting magnets increasing the area of contact for special applications (for wire, pipe, etc.)

Original Designers and Builders of Magnetic Chucks

O. S. WALKER CO. Inc.

WORCESTER 6, MASSACHUSETTS

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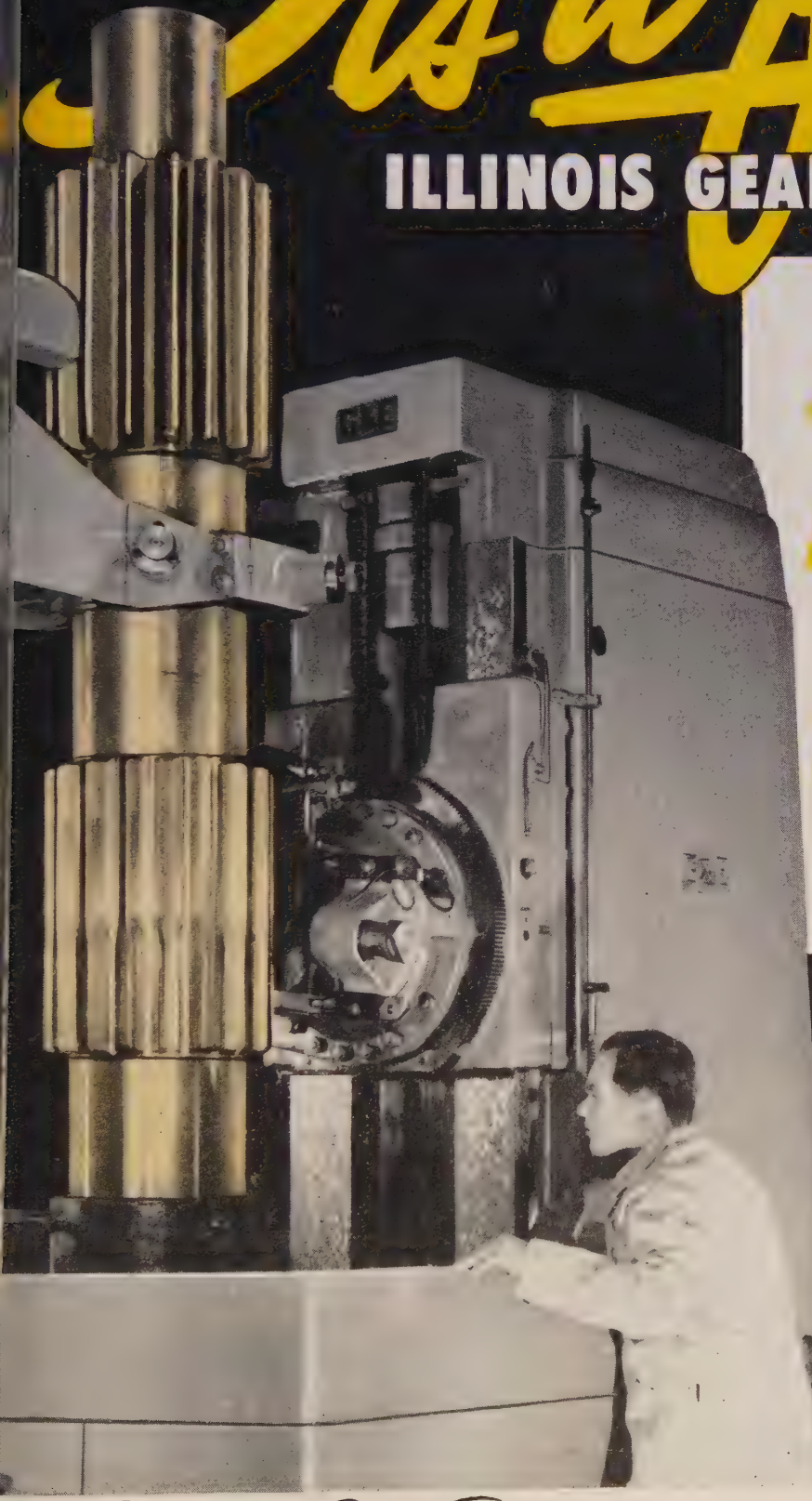
It's a fact-

ILLINOIS GEARS MEAN . . .



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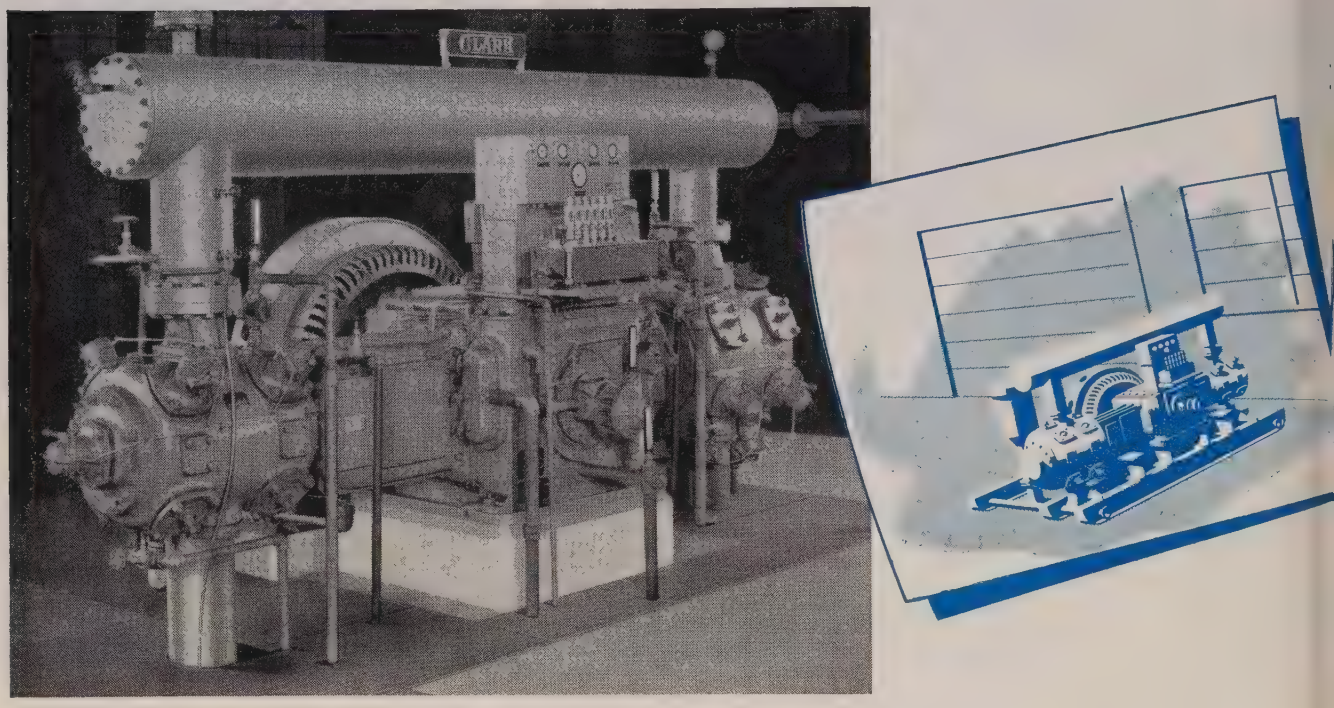
Need to replace a compressor?

HERE'S HOW TO AVOID PRODUCTION LOSSES DURING CHANGEOVER



Clark 150 hp, CMA-2 Balanced/Opposed Motor Driven Compressor in a Pennsylvania metal forging shop.

Normally, replacing an old or inadequate compressor involves either serious losses in plant air capacity during changeover, or requires a building addition to house the new unit. Such dislocation and unnecessary expense can be avoided with a Clark Balanced/Opposed Compressor.

Because of perfect balance and overhung rotor construction, it's a simple matter to mount an average size Clark unit on a steel skid and operate it outside of the compressor building, while the old unit is being torn down and the foundation is completed for the new one. When ready to change over, the new unit is easily taken inside — skid and all — bolted down to the new foundation and tied into the existing piping facilities. *A weekend is usually enough for the job!*

Furthermore, the compact design of the Clark Balanced/Opposed Compressor enables doubling — *even tripling* — air capacity, using the same floor area occupied by outmoded, inadequate compressors.

For air compressors within the 150-4500 hp range, write for Bulletin 118 or see your nearest Clark representative.

CLARK BROS. CO., OLEAN, N. Y.
Division of Dresser Operations, Inc.
Sales Offices in Principal Cities Throughout the World

PRECISION BY THE TON

CLARK

balanced/opposed compressors

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The Market Outlook

BUYERS will have to pay more for their steel purchases over coming months, but how much more will not be possible of determining for some weeks to come. At the moment, leading steelmakers, including U. S. Steel Corp., are effecting increases in extras on certain products which will set the immediate market pattern. But, significantly, few changes in published base prices are being announced. These may come later, probably when producers can better appraise their cost position in the light of whatever wage settlement stems from impending negotiations with the steelworkers' union.

EXTRAS GOING UP—An increasing number of producers are revising extras upward. It is difficult to determine the average effect of these changes on consumers' costs as ordering patterns probably will be changed to some extent. Increases, however, amount to a little more than $5 per ton on hot-rolled bars and just slightly under $10 on cold-finished. Revised cards on hot-rolled and cold-rolled carbon sheets incorporate advances of $1 and $2 per ton. Various divisions of U. S. Steel announced adjustments covering carbon hot-rolled and cold-finished bars, reinforcing bars, carbon tube rounds, carbon rods, wire and wire products, alloy bars, and semifinished steel, effective Apr. 30. Another producer, Armco Steel Corp., on May 1, effected changes on sheets, including hot and cold-rolled, silicon, galvanized, enameling stock and long ternes.

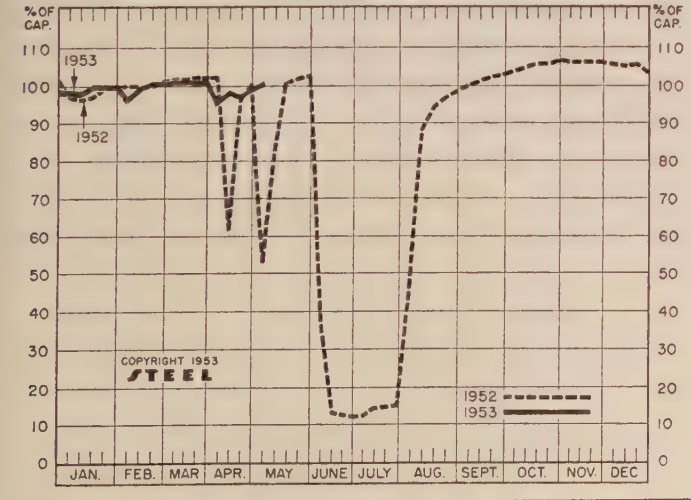
RAIL PRICES RISING—An outstanding exception with respect to the apparent policy of holding base prices unchanged for the present concerns rails and track accessories. One leading producer has just announced increases of $6 per ton on rails and $3 on accessories. Other makers are understood to be considering similar action, prices on these products long having been thought too low. Other product exceptions as regards base price action may develop, but, generally, producers are expected to concentrate on extras for the present.

FANNING OUT—Indications are higher mill prices will be reflected quickly in warehouse schedules. Some distributors already have adjusted their quotations upward on bars to compensate for the increases in mill extras. Expectations are they will move similarly with respect to sheets and other items as new extra cards come through. Converters and further processors, such as fastener makers, may move for higher prices on their products to offset increased steel costs. Extent of such pass-through increases will likely depend upon robustness of demand and competitive conditions.

COMPOSITES—With most of the current price revisions confined to extras, STEEL's weighted index on finished steel continues unchanged at 181.31. Further weakness has developed in scrap, the steelmaking grade composite being down $1 from a week ago, now standing at $41.67, lowest since November, 1950, when it was $41.33, and comparing with the high of $45 in March this year. Current demand for scrap is extremely sluggish with the mills disinclined to add to their substantial stockpiles in the face of possible labor trouble in the event wage negotiations stall.

PRODUCTION—Supported by surprisingly strong and persistent demands from all consuming directions, notably for sheets, bars, plates and shapes, steelmaking operations are being pushed to the limit of available facilities. The national ingot rate last week went up 1 point to 100.5 per cent of capacity, equal to output for the week of about 2,270,000 tons.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended May 2	Change	Same Week 1952	Same Week 1951
Pittsburgh	98	— 1.5*	44	101
Chicago	105.5	0*	50	106.5
Mid-Atlantic	97.5	0	70	101
Youngstown	106	0	45	104
Wheeling	101	+ 1.5	77	97.5
Cleveland	103	— 1	44	99.5
Buffalo	106.5	0	35	104
Birmingham	102	+ 1	44	100
New England	86	+ 1	35	98
Cincinnati	97.5	+ 1.5	60	102
St. Louis	92	+ 5.5	44.5	92.5
Detroit	109	+ 2	64.5	105
Western	110	+ 4	82.5	104
Estimated National Rate	100.5	+ 1	53	104

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 47 Production-Engineering News—p. 97

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Apr. 28 1953	Apr. 21 1953	Month Ago	March Average
(1947-1949=100)	130.9	130.7	130.7	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Apr. 28, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.688	Sheets, galv.	6.765
Track bolts	10.033	Strip, C.R., carbon	5.100
Tie plates	4.825	Strip, C.R. stainless (lb)	0.333
Joint bars	4.925	Pipe, black, buttweld (100 ft).	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft).	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.685	Terne plate (100 lb base box).	7.750
Bars, stainless (lb)	0.153	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.150	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	6.092	Wire, barbed (80 rod spool)	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted: Calculated by STEEL*	Apr. 30 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	181.31	181.31	181.31	171.92	135.91
Index in cents per lb.	4.912	4.912	4.912	4.657	3.682

ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*					
Finished Steel NT	$110.98	$110.98	$110.98	$106.32	$81.14
No. 2 Fdry, Pig Iron, GT	55.04	55.04	55.04	52.54	39.65
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.18
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.26
Steelmaking Scrap, GT	41.67	42.67	44.17	43.00	40.50

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Apr. 30 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del Philadelphia	4.502	4.502	4.502	4.223	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.918	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60–75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.80
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.20
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, 5/32-9/64", Pitts.	4.425	4.425	4.425	4.10–30	3.175
PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.00
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del, Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	42.23
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$43.00	$44.00	$44.00	$44.00	$40.25
No. 1 Heavy Melt, E. Pa.	42.50	43.50	44.50	42.50	39.00
No. 1 Heavy Melt, Chicago	39.50	40.50	42.50	42.75	39.25
No. 1 Heavy Melt, Valley	43.50	42.00	44.25	44.00	40.25
No. 1 Heavy Melt, Cleve.	41.25	42.00	44.25	43.00	39.75
No. 1 Heavy Melt, Buffalo	43.50	45.50	47.00	43.00	43.00
Rails, Rerolling, Chicago	51.50	51.50	56.00	52.50	49.50
No. 1 Cast, Chicago	42.50	42.50	44.00	49.00†	69.00

† F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connisvl.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry, Connisvl.	17.00	17.00	17.00	17.50	14.875
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	18.00

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies on pages 184-185.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S9	....	51.38	....	....
Woodward,Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda,N.Y. W12	54.50	55.00	55.50	....
No.Tonawanda,N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester,N.Y., del.	57.52	58.02	58.52	....
Syracuse,N.Y., del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50	....	55.00	....
IndianaHarbor,Ind. I-2	54.50	....	55.00	....
So.Chicago,Ill. W14	54.50	55.00	55.00	....
So.Chicago,Ill. Y1	54.50	55.00	55.00	....
So.Chicago,Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1	....	59.50	60.00	....
Fontana,Calif. K1	60.50	61.00	....	....
GraniteCity,Ill. G4	56.40	56.90	57.40	....
St. Louis, del. (inc. tax)	57.15	57.65	58.15	....
Ironton,Utah C11	54.50	55.00	....	....
Geneva,Utah C11	54.50	55.00	....	....
LoneStar, Tex. L6	50.50	*51.00	51.00	....
Minnequa,Colo. C10	56.50	57.50	57.50	....
Rockwood,Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	55.00	55.00	55.50
Pitts.,N.&S. sides, Ambridge Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead, Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer,Pa. U5	54.50	....	55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50	....	....	....
McKeesport,Pa. N3	54.50	....	....	55.50
Monessen,Pa. P7	56.50	....	....	....
Sharpsville,Pa. S6	....	....	55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton
(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$65.5
Buffalo H1	66.7

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.0
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.5
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.5
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.5

CHARCOAL PIG IRON, Gross Ton
(Los phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$68.5

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.5
Steelton,Pa. B2	62.5
Philadelphia, delivered	66.0
Troy,N.Y. R2	62.5

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NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

imary Metals

per: Electrolytic 29.50-30.00c, Conn. Val- Lake nom.; foreign electrolytic, del. 29.50- 0c.

s Ingots: 85-5-5-5 (No. 115) 26.00c; 0-2 (No. 215) 34.75c; 80-10-10 (No. 305) 0c; No. 1 yellow (No. 405) 21.25c.

: Prime western 11.00c; brass special 5c, intermediate 11.50c; East St. Louis; grade 12.35c, and special high grade 0c delivered.

d: Common 12.30c; chemical 12.40c; cor- ng, 12.40c, St. Louis.

nary Aluminum: 99% plus, ingots 20.50c, 19.50c. Base prices for 10,000 lb and . Freight allowed on 500 lb or more but in excess of rate applicable on 30,000 lb orders.

ondary Aluminum: Piston alloys 22.50- 0; No. 12 foundry alloy (No. 2 grade) 0-22.50; steel deoxidizing grades, notch s, granulated or shot: Grade 1, 23.00-24.00; de 2, 22.50-23.50; grade 3, 22.00-23.50; de 4, 20.50-23.00.

gnesium: Commercially pure (99.8%) stand- ingots, 10,000 lb and over 27.00c, f.o.b. eport, Tex.

: Grade A, prompt RFC, 121.50c; outside rket 95.00c.

timony: American 99-99.8% and over but meeting specifications below 34.50c; 99.8% over (arsenic 0.05% max., other impuri- 0.1% max.) 35.00c; f.o.b. Laredo, Tex., bulk shipments.

kel: Electrolytic cathodes, 99.9%, base sizes refinery, unpacked, 60.00c; 25-lb pigs, 5c; "XX" nickel shot, 63.65c; "F" nickel t or ingots, for addition to cast iron, 60.00c. ces include import duty.

reury: Open market, spot, New York, $195- 7, per 76-lb flask.

imium: "Regular" straight or flat forms, del; special or patented shapes $2.15.

yllium-Copper: 3.75-4.25% Be, $40.00 per of contained beryllium, with balance as cop- at market price on date of shipment, f.o.b. ading, Pa.

balt: 97.99%, $2.40 per lb for 500 lb (kegs); 42 per lb for 100 lb (case); $2.47 per lb ler 100 lb.

ld: U. S. Treasury, $35 per ounce.

ver: Open market, New York 85.25c per oz.

tinum: $90-$93 per ounce from refineries.

lladium: $23-$24 per troy ounce.

dium: $165-$175 per troy ounce.

anium (sponge form): $5 per pound.

olled, Drawn, Extruded Products

COPPER AND BRASS

ents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

eet: Copper 50.48; yellow brass 42.87; com- rcial bronze, 95% 49.89; 90% 48.76; red ass, 85% 47.11; 80% 45.99; best quality, .43; nickel silver, 18%, 59.84; phosphor- nze grade A, 5%, 70.50.

d: Copper, hot-rolled 46.83; cold-drawn .08; yellow brass free cutting, 36.68; com- rcial bronze 95% 49.58; 90% 48.45; red ass 85%, 46.80; 80%, 45.68.

amless Tubing: Copper 50.42; yellow brass .78; commercial bronze, 90%, 51.32; red ass, 85%, 49.92.

ire: Yellow brass 43.16; commercial bronze, %, 50.18; 90%, 49.05; red brass, 85%, .40; 80%, 46.28; best quality brass, 44.72.

(Base prices, effective Apr. 1, 1953)

pper Wire: Bare, soft, f.o.b. eastern mills, 0,000 lb lots, 37.46; 30,000 lb lots, 37.58; .l. 38.08. Weatherproof, 100,000 lb, 37.85; ,000 lb, 38.10; l.c.l., 38.60. Magnet wire l., 15,000 lb or more 43.93; l.c.l., 44.68.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders, Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $17.50 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $17.50 per cwt. Traps and bends: List prices plus 30%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Mar. 9, 1953) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill, efective Mar. 9, 1953) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 58.00c-65.00c; 25 to 99 lb, 48.00c-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $8.

DAILY PRICE RECORD

'53	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
pr. 29-30	29.50-30.00	12.30	11.00	95.00	20.50	34.50	60.00	85.25
pr. 28	29.75-30.00	11.80	11.00	96.00	20.50	34.50	60.00	85.25
pr. 24-27	29.50-30.00	11.80	11.00	94.00	20.50	34.50	60.00	85.25
pr. 23	29.50-30.00	11.80	11.00	92.00	20.50	34.50	60.00	85.25
pr. 22	30.00	11.80	11.00	93.50	20.50	34.50	60.00	85.25
pr. 20-21	30.00-30.50	11.80	11.00	95.00	20.50	34.50	60.00	85.25
pr. 17-18	30.00-30.50	12.30	11.00	97.50	20.50	34.50	60.00	85.25
pr. 16	30.00-30.50	12.30	11.00	98.00	20.50	34.50	60.00	85.25
pr. 15	30.00-32.00	12.30	11.00	95.00	20.50	34.50	60.00	85.25
pr. 14	30.00-32.00	12.80	11.00	98.50	20.50	34.50	60.00	85.25
pr. 13	30.00-32.00	12.80	11.00	99.50	20.50	34.50	60.00	85.25
pr. 10-11	30.00-32.00	12.80	11.00	105.00	20.50	34.50	60.00	85.25
pr. 9	30.00-33.00	12.80	11.00	110.50	20.50	34.50	60.00	85.25
pr. 7-8	30.00-33.00	12.80	11.00	116.25	20.50	34.50	60.00	85.25
pr. 6	30.00-33.00	13.30	11.00	116.25	20.50	34.50	60.00	85.25
pr. 2-4	30.00-34.50	13.30	11.00	116.50	20.50	34.50	60.00	85.25
pr. 1	30.00-34.50	13.30	11.00	118.50	20.50	34.50	60.00	85.25

OTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime estern, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, lk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. ver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled, oval, carbonized, carloads 81.00c; 5000 to 29,999 lb, 83.00c; 500 to 4999 lb, 85.00c; 1 to 499 lb, 89.00c, f.o.b. Cleveland.

Nickel Chloride: In 100 lb bags; 10,000 lb and over, 37.00c; 5000 to 9900 lb, 38.00c; 400 to 4900 lb, 40.00c; 300 lb, 42.00c; 200 lb, 43.00c; 100 lb, 45.00c, f.o.b. Cleveland.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers $1.10 per lb; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac. Based on $1.215 tin.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more. Based on $1.215 tin.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 20,000 pounds, f.o.b. shipping point; on lots over 20,000 pounds at one time, of any or all kinds of scrap, add 1 cent per pound.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	28.625	28.625	27.875
Yellow Brass	21.375	21.125	19.625
Commercial Bronze			
95%	27.250	27.000	26.500
90%	26.125	25.875	25.375
Red Brass			
85%	25.125	24.875	24.375
80%	24.125	23.875	23.375
Best Quality(71-80%)	22.500	22.250	21.750
Muntz metal	20.000	19.750	19.250
Nickel silver, 10%	25.250	25.000	12.625
Phos. Bronze, A	30.625	30.375	29.375
Naval Brass	20.000	19.750	19.250
Manganese Bronze	20.000	19.750	19.250

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 22.50c, nom.; No. 2 copper 21.00c, nom.; light copper 19.50c, nom.; refinery brass (60% copper) per dry copper content 19.50c.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Carlots, delivered)

No. 1 copper 19.00c, nom.; No. 2 copper, nominal; light copper, nominal; No. 1 composition borings nominal; No. 1 composition solids, nominal; radiators, nominal; heavy yellow brass solids, nominal; yellow brass turnings, nominal.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

2S aluminum clippings, 15.50-16.50c; mixed clippings, 13.00-15.00c; old aluminum sheet, 13.00-13.50c; old aluminum cast, 13.00-13.50c; borings and turnings, 12.50-14.00c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 23.00; No. 2 19.50-20.00; light copper 17.50-18.00; No. 1 composition red brass 17.00; No. 1 composition turnings 16.50; mixed brass turnings 10.00; new brass clippings 17.50; No. 1 brass rod turnings 16.00; light brass 10.00; heavy yellow brass 12.50; new brass rod ends 16.50; auto radiators, unsweated 13.00; cocks and faucets 15.00; brass pipe 16.00.

Aluminum: Clippings 2S 11.50; old sheets 8.00; crankcase 8.00; borings and turnings 5.50; pistons and struts 5.00.

Tin: No. 1 pewter 55.00; block tin pipe 80.00; No. 1 babbitt 45.00.

Lead: Heavy 9.25-9.75; battery plates 4.75-5.00; linotype and stereotype 11.00-11.50; electrotype 9.25-9.50; mixed babbitt 13.75-14.00.

Zinc: Old zinc, 4.50; new die cast scrap, 4.50; old die cast scrap, 3.50.

Nickel: Sheets and clips $1.00; rolled anodes $1.00; turnings 85.00; rod ends $1.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

The Metal Market

Industry seeks answer to metals price instability, successor to supply problems. Worst is over in price declines. Copper selling below 30 cents

STABILITY in metal prices is growing into a gnawing problem for both producers and consumers, with a solution as urgently needed as stability of supply.

Buyers haven't been sorry to see some metals come down from their ceiling perches—they wanted to see an economic level established. What they didn't bargain for came after the original tumbles, when prices have been about as steady as Mexican jumping beans. Buyers beef that you have to be an expert in commodity trading to buy a pound of metal, believe many of the fluctuations unnecessary.

Peril Past—Today the worst is over in price declines. Tin and copper can be expected to continue slipping, but lead and zinc have rounded bottom. Other major metals are relatively steady.

Lead has been obviously underpriced when compared with demand estimates. Producers were looking for slightest provocation to get lead back to more sound footing; when battery makers and other volume users started putting in their May orders, the tide turned.

Industry eats into stocks in a declining market, but when the trend reverses it often overorders to replenish inventory. St. Joseph Lead Co. raised its price Wednesday to 12.5 cents, New York, and other producers followed suit, hoping the upturn had at last materialized.

Down Again—Brass and bronze ingot makers had to nip prices 1 to 1.5 cents a pound last week, second decrease since decontrol. While the latest cut is said to be possible because of lower scrap prices—tin, copper, brass and bronze—the ingot makers have found foundry business below expectations.

Stocks of copper and copper products in fabricators' hands have decreased according to STEEL's quarterly survey (p. 55). Reports indicate deliveries from mills slower. In aluminum stocks are up over the last quarter and deliveries also take longer.

Slipping Slowly—Copper competition is sharpening as custom smelters edged prices below primary metal for the first time since controls were removed. Imported metal will also be available at below 30 cents in increasing quantities.

Indicating what custom smelters expect to sell copper for in about 90 days are scrap buying prices, which have weakened considerably in the past month. Today they are the equivalent of 26-cent copper, with No. 1 scrap at 22.5 cents, No. 2 at 21 cents and light copper at 19.5 cents.

Wanted: Sound Mining Policy

Western mining men have no qualms about telling the government what's wrong with its mineral policies. The House Small Business Committee, in Denver, San Francisco and Spokane hearings was told the government's attitude toward small mining operations was making a shambles of the strategic and critical metals program. Many complaints were heard on the inroads being made by foreign competition forcing wholesale mine closings, particularly in lead and zinc. Miners want revisions in tariff policy, tax and public land policies that will encourage exploration and development, better timing in stockpile buying, and sounder purchase programs to build domestic sources of supply.

Zinc Men Battle Over Tariff

Die casters believe 15.5 cents a pound is "an uneconomic level" for zinc, and strongly oppose any sliding scale tariff pegged at that mark. Speaking before the American Zinc Institute's annual meeting in St. Louis last week (p. 57), W. J. During, executive vice president, Precision Castings Co. Inc., said the zinc industry is "committing suicide" by advocating a tariff to hold that price, predicting it would cut die casters' use 50 to 60 per cent in a year.

Throwing away his prepared speech, Mr. During said all estimates of special high grade use this year would be invalid if the protective tariff legislation is passed. Die casters get about 40 per cent of their metal from Canada. "The domestic zinc industry for ten years hasn't been able to satisy our needs", says Mr. During. "To raise zinc to a non-competitive level is an irresponsible action."

Heart of the matter is this: Imports have taken much blame for price gyrations. Domestic zinc producers favor the sliding scale tax; custom smelters don't. Everyone would welcome stabilization of the industry, but arguments over the means will be heard for some time. One objection to the bill is that zinc prices would reverse direction every quarter under the Simpson bill, now pending in Congress, unless the foreign market strengthens materially. Die casters think setting too high a price or continuing price moves will force zinc people to default to aluminum and magesium.

Nickel Looks to Markets

Nickel men are already looking for normal-times markets. Restrictions on end uses of nickel have temporarily stopped effective development of new uses. Dr. John F. Thompson, chairman, International Nickel Co., says "some may have been permanently diminished or even permanently lost" but believes new fields and uses can be discovered. Inco last year maintained production at capacity for third successive year and supplied more than 75 per cent of the nickel used by the free world. Deliveries of nickel in all forms totaled 249 million pounds.

Rally in Tin

Controversy continues on why tin prices broke so suddenly and sharply. Here's how R. C. Clark, manager Nathan Trotter & Co., New York, explains it: "I think the decline was almost entirely due to an overextended position on the part of currency manipulators who were caught off balance by the sudden change in attitude of the Communists. Nearly everybody was under the RFC umbrella, and when prices began to tumble they desperately tried to unload. Even now there are people still carrying tin bought at $1.20 or thereabouts and who still would like to get rid of it."

what's cookin'

in production economy?

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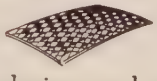
e door handles . . . another perfect lication of Nickeloid Metals as used many well-known makes of ranges.

product beauty is more than skin deep

The stove industry is just one of many that has made wide and successful use of Nickeloid Metals. Manufacturers of ranges and appliances have found that appearance is improved, manufacturing costs, reduced, with this **finished** raw material Chrome Steel, as shown in the illustrations of stove parts on this page, serves a functional purpose as well as providing attractive, durable trim.  Are YOU taking advantage of this modern method in the design and manufacture of **your** product? It will pay you to investigate.

AMERICAN NICKELOID COMPANY
Peru 1, Illinois

pre-plated metals for industry

NICKELOID METALS (Pre-Plated)
NICKEL · CHROMIUM · BRASS · COPPER
Electro-plated TO ALL COMMON *Base* METALS
ALSO LACQUERED COLORS
SHEETS AND COILS
OLDEST AND LARGEST PRODUCERS OF PRE-PLATED METALS

Semifinished and Finished Steel Products

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on pages 162-163.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa U5 .....54.00
Seattle S24 .....75.00

INGOTS, Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....65.00
Midland, Pa. C18 ....57.00
Munhall, Pa. U5 .....57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$59.00
ClairtonPa. U5 .....59.00
Ensley,Ala. T2 .....59.00
Fairfield, Ala. T2 .....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 ....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 ....59.00
SoDuquesne,Pa. U5 ..59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 .....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....78.50
Johnstown,Pa. B2 ....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3, S24 .....89.50
So.Chicago R2,U5,W14.70.50
So.Duquesne,Pa. U5 ...70.50
So.SanFrancisco B3 ..89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$76.00
Buffalo R2 .....76.00
Canton,O. R2 .....76.00
Canton,O. T7 .....78.60
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....76.00
Houston S5 .....84.00
Ind.Harbor,Ind. Y1 ....76.00
Johnstown,Pa. B2 ....76.00
Lackawanna,N.Y. B2..76.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....76.00
Midland,Pa. C18 .....76.00
Munhall,Pa. U5 .....76.00
Seattle S24 .....96.00
So.Chicago R2,U5,W14.76.00
So.Duquesne,Pa. U5 ..76.00
Struthers,O. Y1 .....76.00
Warren,O. C17 .....76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R3 .....87.50
So.Chicago,Ill. R2 ....87.50
So.Duquesne,Pa. U5 ..87.50

SHEET BARS (NT)
Fontana,Calif. K1 ...$93.18

SKELP
Aliquippa,Pa. J5 .....3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 ....3.55

WIRE RODS
Alton,Ill. L1 .....4.70
AlabamaCity, Ala. R2..4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.125
Houston S5 .....4.725
Johnstown,Pa. B2 ....4.325
Joliet,Ill. A7 .....4.325
KansasCity,Mo. S5 ....4.665
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ...4.575
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.325
Pittsburg,Calif. C11 ...4.975
Portsmouth,O. P12 ....4.525
Roebling, N. J. R5 ....4.425
So. Chicago,Ill. R2 ....4.325
SparrowsPoint,Md. B2..4.425
Sterling,Ill.(1) N15 ...4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 ...5.125
Worcester,Mass. A7 ...4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
So.Chicago,Ill. U5 ....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 ....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 .....4.50
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.25
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity,Mo. S5 ....4.45
Lackawanna,N.Y. B2 ..3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 ...4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 ....4.56
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.50
So.Chicago,Ill. U5, W14.3.85
So.SanFrancisco B3 ....4.40
Torrance,Calif. C11 ....4.45
Weirton,W.Va. W6 ....4.10

Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....5.05
Lackawanna,N.Y. B2 ..3.90
Munhall,Pa. U5 .....3.85
So. Chicago,Ill U5 ....3.85

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.725
Fontana,Calif. K1 ....6.125
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 ....4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala T2 .....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 ....5.80
Ind.Harbor,Ind Y1 ....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill. U5 .....5.80
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.30

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 .....5.75

BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 ....3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ...6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ..6.65
Gary,Ind. U5 .....5.95
Geneva,Utah C11 .....5.95
Ind.Harbor,Ind. I-2 ...5.95
Ind.Harbor,Ind. Y1 ....6.45
Johnstown,Pa. B2 .....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So.Chicago,Ill. U5 .....5.95
SparrowsPoint,Md. B2..5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ..5.55
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.25
Johnstown,Pa. B2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparrowsPoint,Md. B2..5.25

FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ..4.95
Ind.Harbor,Ind. I-2 ....4.95
Munhall,Pa. U5 .....4.95
So.Chicago, Ill. U5 ....4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.15
Cleveland,c.l. R2 .....4.50
Warren,O., c.l. R2 ....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15) A10 ..3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 .....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ..4.35
Ecorse,Mich. G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1..4.55
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 ....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 ....6.50
Houston S5 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.90
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Minnequa.Colo. C10 ....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14.3.90
SparrowsPoint,Md. B2 ..3.90
Stubenville,O. W10 ....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 .....4.20
Youngstown R2, U5, Y1.3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.70
Geneva,Utah C11 .....5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 ....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity, Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....4.65
Miton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11.3.95
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
Seattle B3, N14, S24 ..4.70
So.Chicago R2,U5,W14 ..3.95
So.Duquesne,Pa. U5 ...3.95
So.SanFran.,Calif. B3...4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....3.95
Torrance.Calif. C11 ....4.65
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5 ....3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta A11 .....4.50
Niles,Calif. P1 .....4.65
SanFrancisco S7 .....5.00

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.15

BARS,Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.675
Buffalo R2 .....4.675
Canton,O. T7 .....4.72
Canton,O. R2 .....4.675
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....4.675
Houston S5 .....5.075
Ind.Harbor,Ind. I-2, Y1.4.675
Johnstown,Pa. B2 ....4.675
KansasCity,Mo. S5 ....5.275
Lackawanna,N.Y. B2 ..4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.675
So.Chicago R2,U5,W14.4.675
So.Duquesne,Pa. U5 ..4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675

BARS & SMALL SHAPES, H. R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala. T2 .....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich G5 .....6.675
Fairfield,Ala. T2 .....5.925
Fontana,Calif. K1 ....6.975
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 ...5.925
IndianaHarbor,Ind. Y1.6.425
Johnstown,Pa. B2 ....5.925
Lackawanna,N.Y. B2 ..5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 ..5.925
So.San.Francisco B3 ...6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ...4.925
BeaverFalls,Pa. R2 ...4.925
BeaverFalls,Pa. M12..4.925
Buffalo B5 .....4.975
Camden,N.J. P13 .....5.375
Carnegie,Pa. C12 .....4.925
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 ....4.925
Detroit P17, R7 .....5.075
Detroit B5 .....5.125
Donora,Pa. A7 .....4.925
Elyria,O. W8 .....4.925
FranklinPark,Ill. N5 ..4.925
Gary,Ind. R2 .....4.925
GreenBay,Wis. F7 ....4.925
Hammond,Ind. L2,M13.4.925
Hartford,Conn. R2 ....5.475
LosAngeles R2 .....6.375
Mansfield,Mass B5 ....5.475
Massillon,O. R2, R8 ..4.925
Monaca,Pa. S17 .....4.925
Newark,N.J. W18 .....5.375
Plymouth,Mich. P5 ....5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 ...5.475
Readville,Mass. C14 ...5.475
St.Louis,Mo. M5 .....5.
So.Chicago,Ill. W14 ...4.9
SpringCity,Pa. K3 ....5.3
Struthers,O. Y1 .....4.9
Waukegan,Ill A7 .....4.9
Youngstown Y1 .....4.9
Youngstown F3 .....4.2

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.
BeaverFalls,Pa. M12 ....6.
Bethlehem, Pa. B2 .....6.
Buffalo B5 .....6.
Camden,N.J. P13 .....6.
Canton,O. R2 .....6.
Canton,O. T7 .....5.
Carnegie,Pa. C12 .....6.
Chicago B5 .....6.
Chicago W18 .....6.
Cleveland A7 .....6.
Cleveland C20 .....6.
Detroit P17, R7 .....6.
Detroit B5 .....6.
Donora,Pa. A7 .....6.
Elyria,O. W8 .....6.
Gary,Ind. R2 .....6.
Hammond,Ind. L2,M13.6.
Hartford,Conn. R2 .....6.
Lackawanna,N.Y. B2 ..6.
Mansfield,Mass. B5 ....6.
Massillon,O. R2,R8 ....6.
Midland,Pa. C18 .....6.
Monaca,Pa. S17 .....6.
Newark,N.J. W18 .....6.
Plymouth,Mich. P5 .....6.
So.Chicago,Ill. R2, W14.6.
SpringCity,Pa. K3 .....6.
Struthers,O. Y1 .....6.
Warren,O. C17 .....6.
Waukegan,Ill. A7 .....6.
Worcester,Mass. A7 ....6.
Youngstown Y1 .....6.
Youngstown F3 .....6.

BARS, Reinforcing (Fabricato
AlabamaCity,Ala R2 ...3.
Atlanta A11 .....4.
Buffalo R2 .....3.
Cleveland R2 .....3.
Emeryville,Calif. J7 ....4.
Fairfield,Ala. T2 .....3.
Fontana,Calif. K1 ....4.
Gary,Ind U5 .....3.
Houston S5 .....4.
Ind.Harbor,Ind. I-2, Y1.3.
Johnstown,Pa. B2 .....3.
KansasCity,Mo. S5 ....4.
Lackawanna,N.Y. B2...3.
LosAngeles B3 4
Milton,Pa. B6 .....4.
Minnequa,Colo. C10 ....4.
Niles,Calif. P1 .....4.
Pittsburg,Calif. C11 ...4
Pittsburgh J5 .....3.
SandSprings,Okla. S5 ..4.
Seattle B3, N14, S24 ..4
So.Chicago,Ill. R2 .....3.
So.Duquesne,Pa. U5 ....3.
So.SanFrancisco B3 ....4.
SparrowsPoint,Md. B2...3
Sterling,Ill. (1) N15 ....4.
Struthers,O. Y1 3
Torrance,Calif. C11 ....4.
Youngstown R2, U5 ....3.

BARS, Reinforcing
(Fabricated; to consumers)
Huntington,W.Va. W7 ..5.
Johnstown, ¼-1" B2 ...5.
KansasCity S5 .....6.
LosAngeles B3 .....5.
Marion,O. P11 .....5.

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & W
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Cor
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire C
J1 Jackson Iron & Steel C
J3 Jessop Steel Co.
J4 Johnson Steel & Wire C
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Meta
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co
L7 Lukens Steel Co.

...le B3 N14 .....5.80
... Springs S5 .....6.45
...nFrancisco B3 ....5.45
...rowsPt. ¼-1" B2 ..5.25
...amsport,Pa. S19 ...5.35

... STEEL BARS
...agoHts.(3,4) C2 ...4.75
...agoHts.(3,4) I-2 ...4.75
...klin,Pa.(3,4) F5 ...4.75
...Worth,Tex.(26) T4..4.85
...ngt,W.Va.(3) W7 ..5.75
...ton,O.(3) P11 .....4.75
...ne,Ill.(3) R2 .....4.05
...wanda(3,4) B12 ...5.00
...amsport(3) S19 ...5.25
...amsport,Pa. S19 ...5.35

..., Wrought Iron
...dd 4.7% to base and extras)
...omy,Pa.(S.R.) B14.9.60
...omy,Pa.(D.R.)B14 11.90
...omy(Staybolt) B14 12.20
...Rks.(Staybolt) L5.14.50
...Rks.(S.R.) L5 ....9.60
...Rks.(D.R.) L5 ..13.00

...TS, Hot-Rolled Steel
(18 gage and heavier)
...amaCity,Ala. R2 ..3.775
...land,Ky.(8)A10 ...3.775
...er,Pa. A10 .....3.775
...eland J5, R2 ....3.775
...shohocken,Pa. A3 ..4.175
...roit M1 .....4.40
...rse,Mich. G5 .....3.975
...field,Ala. T2 .....3.775
...tana,Calif. K1 ....4.825
...y,Ind. U5 .....3.775
...eva,Utah C11 .....3.875
...niteCity,Ill. G4 .....4.30
...Harbor,Ind. I-2, Y1 3.775
...n,Pa. U5 .....3.775
...kawanna,N.Y. B2 ..3.775
...hall, Pa. U5 .....3.775
...s,O. N12 .....5.425
...sburg,Calif. C11 ..4.475
...sburgh J5 .....3.775
...ron,Pa. S3 .....4.175
...Chicago,Ill. W14 ...3.775
...rrowsPoint,Md. B2.3.775
...abenville,O. W10 ..3.775
...rance,Calif. C11 ...4.475
...rren,O. R2 .....3.775
...rton,W.Va. W6 ....3.775
...stLeechburg,Pa. A4.3.925
...ungstown U5, Y1 ..3.775

...ETS, H.R. (19 gage)
...bamaCity,Ala. R2 ..4.925
...er,O. R1 .....5.825
...nsfield,O. E6 .....5.65
...es,O. N12 .....5.675
...rance,Calif. C11 ...5.575

...ETS, Cold-Rolled
...igh-Strength Low-Alloy
...veland J5, R2 ....6.925
...rse,Mich. G5 .....7.475
...tana,Calif. K1 ....7.975
...y,Ind. U5 .....6.925
...ianaHarbor,Ind. Y1 .7.425
...ianaHarbor,Ind. I-2.6.925
...in,Pa. U5 .....6.925
...kawanna(37) B2 ..6.925
...tsburgh J5 .....6.925
...rrowsPoint(38) B2..6.925
...rren,O. R2 .....6.925
...rton,W.Va. W6 ....7.275
...ungstown Y1 .....7.425

...ETS, H.R. (14 ga. heavier)
...igh-Strength Low-Alloy
...veland J5, R2 ....5.675
...nshohocken,Pa. A3 ..5.925
...rse,Mich. G5 .....6.225
...rfield,Ala. T2 .....5.675
...ntana,Calif. K1 ....6.775

Gary,Ind. U5 .....5.675
Ind.Harbor,Ind. I-2 ...5.675
Ind.Harbor,Ind. Y1 ...6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 ..5.675
Munhall U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 ....5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 ....6.025
Youngstown U5 .....5.675
Youngstown Y1 .....6.175

SHEETS, Cold-Rolled Steel
(Commercial Quality)
Butler,Pa. A10 .....4.575
Cleveland J5, R2 .....4.575
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.575
Follansbee,W.Va. F4 ..5.575
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.575
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2,Y1.4.575
Irvin,Pa. U5 .....4.575
Lackawanna,N.Y. B2 ..4.575
Middletown,O. A10 ....4.575
Pittsburg,Calif. C11 ...5.525
Pittsburgh J5 .....4.575
SparrowsPoint,Md. B2..4.575
Steubenville,O. W10 ...4.575
Warren,O. R2 .....4.575
Weirton,W.Va. W6 ....4.575
West Leechburg,Pa. A4..5.45
Youngstown Y1 .....4.575

SHEETS, Galv'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.075
Ashland,Ky.(8) A10 ..5.075
Canton,O. R2 .....5.075
Delphos,O. N16 .....5.675
Dover,O. R1 .....5.775
Fairfield,Ala. T2 .....5.075
Gary,Ind. U5 .....5.075
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2 ...5.075
Irvin,Pa. U5 .....5.075
Kokomo,Ind.(13) C16 ..5.475
MartinsFerry,O. W10 ..5.075
Niles,O. N12 .....6.275
Pittsburg,Calif. C11 ...5.825
SparrowsPoint,Md. B2 .5.075
Steubenville,O. W10....5.075
Torrance,Calif. C11 ....5.825
Weirton,W.Va. W6 ....5.075

SHEETS, Galvanized No. 10, High-Strength Low-Alloy
Irvin,Pa. U5 .....7.625
SparrowsPoint(39) B2..7.775

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.625
Irvin,Pa. U5 .....5.625
Kokomo,Ind.(13) C16 ..6.025
Niles,O. N12 .....6.825

SHEETS ZINCGRIP STEEL No. 10
Butler,Pa. A10 .....5.325
Middletown,O. A10 ...5.325

SHEETS, Electro Galvanized
Cleveland R2 (28) 5.925
Niles,O. R2 (28) 5.925
Weirton,W.Va. W6 ....5.775

SHEETS, Well Casing
Fontana,Calif. K1 .....5.34

BLUED Stock, 29 ga.
Yorkville,O. W10 .....7.00
Follansbee,W.Va. F4 ...7.10
Follansbee (23) F4 ....6.425

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....4.925
Gary,Ind. U5 .....4.925

GraniteCity,Ill. G4 ....5.625
Ind.Harbor,Ind. I-2 ...4.925
Irvin,Pa. U5 .....4.925
Middletown,O. A10 ....4.925
Youngstown Y1 .....4.925

BLACK PLATE
(Base Box)
Aliquippa,Pa. J5 .....$6.50
Fairfield,Ala. T2 .....6.60
Gary,Ind. U5 .....6.50
GraniteCity,Ill. G4 .....6.70
Ind.Harbor,Ind. I-2, Y1.6.50
Irvin,Pa. U5 .....6.50
Niles,O. R2 .....6.50
Pittsburg,Calif. C11 ....7.25
SparrowsPoint,Md. B2 ..6.60
Warren,O. R2 .....6.50
Weirton,W.Va. W6 ....6.50
Yorkville,O. W10 .....6.50

HOLLOWARE ENAMELING
Black Plate (29 gage)
Follansbee,W.Va. F4 ...6.10
Gary,Ind. U5 .....6.10
GraniteCity,Ill. G4 .....6.30
Ind.Harbor,Ind. Y1 ....6.10
Irvin,Pa. U5 .....6.10
Yorkville,O. W10 .....6.35

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	....
Canton,O. R2 ..	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5 ...	5.875	6.125
Ind.Harbor I-2 .	5.875	6.125
Irvin,Pa. U5 ...	5.875	6.125
Kokomo,Ind. C16	6.525	....
MartinsFy.,O.W10	5.875	....
Pittsburg,Cal.C11	6.625	....
SparrowsPt. B2 .	5.875	....
Torrance,Cal.C11	6.625	....

SHEETS, Culvert, No. 16
Pure Iron
Ashland,Ky. A10 .....6.125
Fairfield,Ala. T2 .....6.125
MartinsFerry,O. W10 ..6.125

SHEETS, Hot-Rolled Ingot Iron
18 Gage and Heavier
Ashland,Ky.(8) A10 ..4.025
Cleveland R2 .....4.375
Ind.Harbor,Ind. I-2 ...4.025
Warren,O. R2 .....4.375

SHEETS, Cold-Rolled Ingot Iron
Butler,Pa. A10 .....5.075
Cleveland R2 .....5.175
Middletown,O. A10 ....5.075
Warren,O. R2 .....5.175

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.325
Canton,O. R2 .....5.825

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.425

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....5.875

MANUFACTURING TERNES
(Special Coated)
Fairfield,Ala. T2 .....$7.85
Gary,Ind. U5 .....7.75
Irvin,Pa. U5 .....7.75
Yorkville,O. W10 .....7.75

SHEETS, LT. Coated Ternes, 6 lb
Yorkville,O. W10 .....$8.65

SHEETS, Mfg. Ternes, 8 lb
(Commercial Quality)
Gary,Ind. U5 .....$9.75
Yorkville,O. W10 .....9.75

SHEETS, Long Terne Steel
(Commercial Quality)
BeechBottom,W.Va.W105.475
Gary,Ind. U5 .....5.475
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....5.475
Niles,O. N12 .....6.275
Weirton,W.Va. W6 ....5.475

ROOFING SHORT TERNES
(8 lb Coated)
Gary,Ind. U5 .....9.75

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1.	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11 ..	9.45	9.70
Sp.Pt.,Md. B2 ..	8.80	9.05
Warren,O. R2 ..	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10.	8.70	8.95

STRIP, Hot-Rolled
High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.65
Conshohocken,Pa. A3...5.90
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 .....6.75
Gary,Ind. U5 .....5.65
Ind.Harb.,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Lackawanna,N.Y. B2 ..5.70
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.65
So.SanFrancisco(25) B3.6.40
SparrowsPoint,Md. B2..5.70
Warren,O. R2 .....5.65
Weirton,W.Va. W6 ....6.10
Youngstown Y1 .....6.15
Youngstown U5 .....5.65

STRIP, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5 .....7.45
Cleveland A7 .....7.30
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.15
Lackawanna,N.Y. B2 ..7.90
Sharon,Pa. S3 .....7.30
SparrowsPoint,Md. B2 .7.90
Warren,O. R2 .....7.30
Weirton,W.Va. W6 ....7.95
Youngstown Y1 .....7.80

STRIP, Cold-Rolled Alloy Steel
Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....11.40
Dover,O. G6 .....11.90
Fontana,Calif. K1 ....13.30
Harrison,N.J. C18 ....12.00
Midland,Pa. C18 .....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...11.70
Youngstown C8 .....12.00

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..3.975
Warren,O. R2 .....4.325

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....5.70

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
BrackenridgePa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths) ..	7.05	7.35	7.85	...	...
Vandergrift,Pa. U5	...	7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7 85	8.35	9.60	10.40
Zanesville,O. A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base)
COILS (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	....
Carnegie,Pa. S18	...	7.65	8.25	10.30	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	....	....
Detroit D2	6.45	7.50	8.10	....	....
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6 ...	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	....
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2 ...	6.70	7.60	8.20	....	....
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. N8:					
Cleve.orPitts.Base ...	...	7.65	8.25	10.20	12.50
Worcester,Mass.,Base.	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2..	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7 ..	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6 ...	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	7.65	8.25	10.20	12.50
Spring Steel (Tempered)					
Trenton,N.J. R5 (29) ..	...	...	10.30	12.50	15.35
Harrison,N.J. C18	..	...	10.30	12.50	15.35
NewYork W3	...	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	10.30	12.50	15.35

* Plus 1.575 per 100 lb.

Key to Producers

McLouth Steel Corp.
Mahoning Valley Steel
Medart Co.
Mercer Tube & Mfg. Co.
Mid-States Steel & Wire
Moltrup Steel Products
Monarch Steel Co.

National Supply Co.
National Tube Div.
Nelsen Steel & Wire Co.
NewEng.-HighCarb.Wire
Newman-Crosby Steel
Niles Rolling Mill Div.
Nrthwst. Steel Roll. Mills
Northwestern S.&W. Co.
New Delphos Mfg. Co.

Oliver Iron & Steel Corp.
Oregon Steel Mills

Pacific States Steel Corp.
Pacific Tube Co.
Phoenix Iron & Steel Co.
Pilgrim Drawn Steel
Pittsburgh Coke & Chem.
Pittsburgh Steel Co.
Pittsburgh Tube Co.
Pollak Steel Co.
Portsmouth Division, Detroit Steel Corp.

P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.

U4 Universal Cyclops Steel
U5 United States Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2...3.725
Alton Ill. L1 .....4.20
Ashland,Ky(8) A10 ..3.725
Atlanta A11 .....4.275
Bessemer,Ala. T2 ....3.725
Bridgeport,Con.(10)S15 4.225
Buffalo(27) R2 .....3.725
Butler,Pa. A10 .....3.725
Carnegie,Pa. S18 ....4.225
Conshohocken,Pa. A3 ..4.125
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.025
Fairfield,Ala. T2 ....3.725
Fontana,Calif. K1 ....5.175
Gary,Ind. U5 .....3.725
Houston,Tex. S5 .....4.125
Ind.Harbor,Ind. I-2,Y1.3.725
Johnstown,Pa.(25) B2..3.725
KansasCity,Mo.(9) S5..4.325
Lackw'na,N.Y.(32) B2 3.725
LosAngeles(25) B3 ....4.475
Milton,Pa. B6 .....4.35
Minnequa,Colo. C10 ...4.775
NewBritain(10) S15 ...4.225
N.Tonawanda,N.Y.B11 3.725
Pittsburg,Calf. C11 ...4.475
Riverdale,Ill. A1 .....3.725
SanFrancisco S7 .....5.00
Seattle(25) B3 .....4.725
Seattle N14 .....4.75
Sharon,Pa. S3 .....4.225
So.Chicago, Ill. W14 ...3.725
So.SanFrancisco(25) B3 4.475
SparrowsPoint,Md. B2.3.725
Sterling,Ill. N15 .....4.725
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.725
Weirton,W.Va. W6 ....3.825
WestLeechburg,Pa. A4.3.975
Youngstown U5, Y1 ...3.725

STRIP, Hot-Rolled Alloy
Bridgeprt,Conn.(10) S15.6.05
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .....7.50
Gary, Ind. U5 .....6.10
Houston,Tex. S5 .....6.50
KansasCity, Mo. S5 ....6.70
Midland,Pa. C18 .....5.85
NewBritn.,Conn.(10)S15 6.05
Sharon,Pa. S3 .....6.45
Youngstown U5 .....6.10

STRIP, Cold-Rolled Carbon
Anderson,Ind.(40) G6 ..5.50
Bridgeprt,Conn.(10) S15.5.80
Butler,Pa. A10 .....5.10
Cleveland A7, J5 .....5.10
Dearborn,Mich. D3 .....6.05
Detroit D2 .....5.60
Detroit M1 .....5.45
Dover,O.(40) G6 .....5.50
Ecorse,Mich. G5 .....5.30
Follansbee,W.Va. F4 ...5.10
Fontana,Calif. K1 .....7.00
FranklinPark,Ill.(40)T6 .5.35
Ind.Harbor,Ind. I-2 ....5.35
Lackawanna,N.Y. B2 ..5.10
LosAngeles C1 .....7.15
Mattapan,Mass. T6 ....5.95
Middletown,O. A10 ....5.10
NewBritain(10) S15 ....5.80
NewCastle,Pa. B4 .....5.80
NewCastle,Pa.(40) E5 ...5.70
NewHaven,Conn. D2 ...5.85
NewHaven,Conn. A7 ...5.60
Pawtucket,R.I. R3 ....6.45
Pawtucket,R.I.(21) N8.6.30
Riverdale,Ill.(40) A1 ...5.35
Rome,N.Y. R6 .....5.10
Sharon,Pa. S3 .....5.80
SparrowsPoint,Md. B2 .5.10
Trenton,N.J. R5 .....6.45
Wallingford,Conn. W2 ..6.30
Warren,O.(40) T5 .....5.70
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown C8 (40) ...5.70
Youngstown Y1 .....5.10

STRIP, Electro Galvanized
Dover, O. G6 .....5.50
Warren,O. T5 .....5.70
Weirton,W.Va. W6 ....5.10
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.45
Riverdale,Ill. A1 .....4.30
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.15

ROPE WIRE
Alton,Ill. L1 (43) 8.75
Bartonville,Ill. K4 .....8.95
Buffalo W12 (43) 8.55
Fostoria,O. S1 (43) 8.85
Johnstown,Pa. B2 (43)..8.55
Monessen,Pa. P16 (43)..8.55
Monessen,Pa. P7 (43) ..8.80
Muncie,Ind. I-7 (43) ...8.75
Palmer,Mass. W12 (43)..8.85
Portsmouth,O. P12 (43)..8.55
Roebling,N.J. R5 (43) ..8.85
SparrowsPt. B2 (43) ...8.65
Struthers,O. Y1 (43) ...8.55
Worcester J4, T6 (43) ..8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld. Galv.
AlabamaCity R2	.6.075 6.325
Aliquippa J5	...6.075 6.525‡
Atlanta A11	....6.325 6.675
Bartonville(19)K4	6.075 6.40
Buffalo W12	....5.225 ....
Cleveland A7	...6.075 6.225
CrawfordsvilleM8	6.175 6.475
Donora,Pa. A7	..6.075 6.225
Duluth,Minn. A7.	6.075 6.225
Fairfield T2	.....6.075 6.225
Houston,Tex. S5.	.6.475 6.80
Johnstown B2	...6.075 6.45†
Joliet,Ill. A7	....6.075 6.225
KansasCy.Mo. S5	.6.675 7.00
Kokomo C16	....6.175 6.425
LosAngeles B3	..7.025 ....
Minnequa C10	...6.325 6.70*
Monessen P7	....6.075 6.45
Palmer W12	.....5.525 ....
Pitts.,Calif. C11	..7.025 7.175
Prtsmth.(18)P12	..6.475 ....
Rankin A7	.....6.075 6.225
So.Chicago R2	..6.075 6.325
So.S.Fran. C10	..7.025 7.40*
SparrowsPt. B2	..6.175 6.55†
Sterling,Ill.(1)N15	6.075 6.375
Struthers,O. Y1	..6.075 6.475
Torrance,Cal. C11	7.025 ....
Worcester A7	...6.375 6.525

*Based on 14c zinc; †14.50c zinc; ‡17.5c zinc.

WIRE (16 gage) (Add 4.7% on base and extras)	Anl'd. Galv. Stone	Stone
Aliquippa J5	....10.15	12.15
Bartonvlle(19)K4	10.25	12.00*
Cleveland A7	....10.25	11.55
Crawfrdsville M8.	10.73	12.51
Fostoria,O. S1	..10.40	13.00
Johnstown B2	..10.73	12.58§
Kokomo C16.	10.625†	12.325§
Minnequa C10.	10.40	12.425*
Palmer,Mass. W12.	10.25	12.15
Pitts.,Cal. C11	..10.60	11.90
SparrowsPt. B2	.10.84	12.68§
Sterling(1) N15	10.73†	12.15†
Waukegan A7	...10.25	11.55
Worcester A7	.....	11.85

*Based on 14c zinc; §14.50c zinc. †Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon
AlabamaCity,Ala. R2..5.225
Aliquippa,Pa. J5 (42)...4.85
Atlanta A11 .....5.475
Alton, Ill. L1 .....5.45
Bartonville,Ill. K4 ....5.325
Buffalo W12 .....5.225
Chicago W13 .....5.475
Cleveland A7, C20 ....5.225
Crawfordsville,Ind. M8.5.325
Donora,Pa. A7 .....5.225
Duluth,Minn. A7 ....5.225
Fairfield,Ala. T2 ....5.225
Fostoria,O. (24) S1 ...5.725
Houston S5 .....5.625
Johnstown,Pa. B2 ....5.225
Joliet,Ill. A7 .....5.225
KansasCity,Mo. S5 ....5.825
Kokomo,Ind. C16 ....5.325
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ...5.475
Monessen,Pa. P7 .....5.475
Newark 6-8 ga I-1 ....5.88
No.Tonawanda B11 ...5.225
Palmer,Mass. W12 ....5.525
Pittsburg,Calif. C11 ...6.175
Portsmouth,O. P12 ....5.625
Rankin,Pa. A7 .....5.225
So.Chicago, Ill. R2 ....5.225
So.SanFrancisco C10 ..6.175
SparrowsPoint,Md. B2..5.325
Sterling,Ill.(1) N15 ....5.225
Struthers,O. Y1 .....5.225
Torrance,Calif. C11 ...6.175
Waukegan,Ill. A7 .....5.225
Worcester,Mass. A7 ...5.525

WIRE, Cold-Rolled Flat
Anderson,Ind. G6 .....6.20
Buffalo W12 (43) 6.35
Cleveland A7 (43) 5.85
Crawfs-ville,Ind.M8(43) 5.70
Dover,O. G6 .....6.20
Fostoria,O. S1 (43) 6.00
Kokomo,Ind. C16 (43)..5.70
FranklinPark,Ill. T6(43) 6.20
Massillon,O. R8 (43) ...5.85
Monessen,Pa. P16 (43)..6.35
Monessen,Pa. P7 (43) ..6.10
Pawtkt,R.I.(12) N8 (43)6.85
Trenton,N.J. R5 (43) ...6.15
Worcester,Mass.A7 (43).6.15
Worcester,Mass.T6 (43).6.50
Worcester,Mass.W12(43) 6.65

WIRE, Galv'd ACSR for Cores
Bartonville,Ill. K4 .....8.90
Monessen,Pa. P16 (43)..8.50
Muncie,Ind. I-7 (43) ...8.70
Roebling,N.J. R5 (43) ..8.80
SparrowsPt..Md. B2(43).8.60
Johnstown,Pa. B2 (43)..8.50

WIRE, MB Spring, High Carbon
Aliquippa,Pa. J5 (43) ..6.25
Alton,Ill. L1 (43) 6.55
Bartonville,Ill. K4 .....6.64
Buffalo W12 (43) 6.25
Cleveland A7 (43) 6.25
Donora,Pa. A7 (43) 6.25
Duluth,Minn. A7 (43) ..6.25
Fostoria,O. S1 (43) 6.25
Johnstown,Pa. B2 (43)..6.25
Millbury(12) N6 (43)...8.05
Minnequa,Colo. C10(43).6.50
Monessen,Pa. P7 (43) ..6.25
Monessen,Pa. P16 .....6.75
Muncie,Ind. I-7 (43) ...6.45
Palmer,Mass. W12 (43) 6.55
Pittsburg,Calif. C11(43.7.20
Roebling,N.J. R5 (43)..6.55
Portsmouth,O. P12(43)..6.25
So.Chicago,Ill. R2 (43)..6.25
So.SanFran. C10 (43) ..7.20
SparrowsPt.,Md. B2 (43)6.35
Struthers,O. Y1 (43) ...6.25
Trenton,N.J. A7 (43) ..6.55
Waukegan,Ill. A7 (43)..6.25
Worcester A7, T6 (43)..6.55
Worcester,Mass. W12(43)6.55
Worcester,Mass. J4 (43).6.75

WIRE Upholstery Spring
Aliquippa,Pa. J5 .....6.275
Alton,Ill. L1 .....6.50
Buffalo W12 .....6.275
Cleveland A7 .....6.275
Donora,Pa. A7 .....6.275
Duluth,Minn. A7 .....6.275
Johnstown,Pa. B2 .....6.275
LosAngeles B3 .....7.225
Minnequa,Colo. C10 ...6.525
Monessen,Pa. P7 .....6.275
Monessen,Pa. P16(42) ..6.40
NewHaven,Conn. A7 ..6.575
Palmer,Mass. W12 ....6.575
Pittsburg,Calif. C11 ..7.225
Portsmouth,O. P12 ...6.275
Roebling,N.J. R5 .....6.575
So.Chicago,Ill. R2 ....6.275
So.SanFrancisco C10 ..7.225
SparrowsPoint,Md. B2..6.375
Torrance,Calif. C11 ..7.225
Trenton,N.J. A7 .....6.575
Waukegan,Ill. A7 .....6.275
Worcester,Mass. A7 ...6.575

WIRE, Fine & Weaving (8"Coils)
Alton,Ill. L1 (43) 9.20
Bartonville,Ill. K4 .....9.42
Buffalo W12 (43) 8.90
Chicago W13 .....9.32
Cleveland A7 (43) 8.90
Crawf'sville,Ind. M8(43) 8.90
Fostoria,O. S1 (43) 8.90
Johnstown,Pa. B2 (43)..8.90
Kokomo,Ind. C16 (43).8.90
Monessen,Pa. P16 (43)..8.90
Muncie,Ind. I-7 (43) ...9.10
Palmer,Mass. W12 (43)..9.20
Roebling,N.J. R5 (43) ..9.20
Waukegan,Ill. A7 (43)..8.90
Worcstr.Mass. A7,T6(43)9.20

WIRE, Tire Bead
Bartonville,Ill. K4 ....11.51
Monessen,Pa. P16 (43).11.40
Roebling,N.J. R5 (43).11.55

WOVEN FENCE, 9-15½ Ga. Col
AlabamaCity,Ala. R2 ...135
Ala.City,Ala.,17-18ga.R2 222
Aliqu'pa,Pa.9-14½ga.J5 139‡
Atlanta A11 140
Bartonville,Ill.(19) K4 ..137
Crawfordsville,Ind. M8 ..138
Donora,Pa. A7 133
Duluth,Minn. A7 133
Fairfield,Ala. T2 133
Houston,Tex. S5 145
Johnstown,Pa. B2 138
Johnstown 17ga.,6" B2 .229
Joliet,Ill. A7 133
KansasCity,Mo. S5 149
Kokomo,Ind. C16 140
Minnequa,Colo. C10 ....146*
Monessen,Pa. P7 138
Pittsburg,Calif. C11 156
Rankin,Pa. A7 133
So.Chicago,Ill. R2 135
Sterling,Ill. (1) N15 136

*On 14c zinc; ‡17.5c zinc.

FENCE POSTS **Col.**
ChicagoHts.,Ill. C2 140
Duluth,Minn. A7 133
Franklin,Pa. F5 140
Huntington,W.Va. W7 ..148
Johnstown,Pa. B2 148
Marion,O. P11 140
Minnequa,Colo. C10 138
Moline,Ill. R2 136
So.Chicago,Ill. R2 140
Tonawanda,N.Y. B12 148
Williamsport,Pa. S19 ...158

WIRE, Barbed **Col.**
AlabamaCity,Ala. R2 ...144
Aliquippa,Pa. J5 .....148‡
Atlanta A11 149
Bartonville,Ill.(19) K4 ..146
Crawfordsville,Ind. M8 ..147
Donora,Pa. A7 142
Duluth,Minn. A7 142
Fairfield,Ala. T2 142
Houston,Tex. S5 154
Johnstown,Pa. B2 145
Joliet,Ill. A7 142
KansasCity,Mo. S5 158
Kokomo,Ind. C16 149
Minnequa,Colo. C10 ....153*
Monessen,Pa. P7 147
Pittsburg,Calif. C11 ..162
Rankin,Pa. A7 142
So.Chicago,Ill. R2 144
So.SanFran.,Calif. C10..167*
SparrowsPoint,Md. B2 ..147
Sterling,Ill.(1) N15 145

*On 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop **Col.**
AlabamaCity,Ala. R2 ...132
Atlanta A11 135
Bartonville,Ill.(19) K4 ..132
Crawfordsville,Ind. M8 ..132
Donora,Pa. A7 132
Duluth,Minn. A7 132
Fairfield,Ala. T2 132
Joliet,Ill. A7 132
KansasCity,Mo. S5 144
Kokomo,Ind. C16.....134
Minnequa,Colo. C10 137
Pittsburg,Calif. C11 156
So.Chicago,Ill. R2 132
So.SanFran.,Calif. C10 ..156
SparrowsPoint,Md. B2 ..134
Sterling,Ill.(1) N15 132

NAILS, Stock
To dealers & mfrs. (7) Col.
AlabamaCity,Ala. R2 ...127
Aliquippa,Pa. J5 127
Atlanta A11 130
Bartonville,Ill. (19) K4..127
Chicago,Ill. W13 127
Cleveland A9 (44) 125
Crawfordsville,Ind. M8 ..127
Donora,Pa. A7 127
Duluth,Minn. A7 127
Fairfield,Ala. T2 127
Galveston,Tex. D7 135
Houston,Tex. S5 135
Johnstown,Pa. B2 127
Joliet,Ill. A7 127
KansasCity,Mo. S5 139
Kokomo,Ind. C16 129
Minnequa,Colo. C10 (44).123
Monessen,Pa. P7 127
Pittsburg,Calif. C11 ...146
Portsmouth,O. P12 132
Rankin,Pa. A7 127
So.Chicago,Ill. R2 .. .127
SparrowsPt.Md. B2 129
Sterling,Ill.(1) N15 127
Torrance,Calif. C11 147
Worcester,Mass. A7 133

NAILS, Cut (100 lb keg)
to dealers (33)
Conshohocken,Pa. A3 ..$7.80
Wheeling,W.Va. W10 ...7.80

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	....	4.25
Fairfield,Ala. T2	....	....	....	4.25
Gary,Ind. U5	3.775	3.675	3.725	...
Huntington,W.Va. W7	....	....	....	5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	...
Johnstown,Pa. B2	....	....	...(16)	4.25
Lackawanna,N.Y. B2	3.775	3.675	....	4.25
Minnequa,Colo. C10	*$81.50**	*$79.50**	....	*4.75*
Steelton,Pa. B2	3.775	3.675	....	...
Williamsport,Pa. S19	....	....	....	5.00

*Per net ton.

STAPLES, Polished, Stock
To dealers & mfrs. (7) Col.
AlabamaCity,Ala. R2 ...12
Aliquippa,Pa. J5 12
Atlanta A11 12
Bartonville,Ill. (19) K4..12
Chicago W13 12
Crawfordsville,Ind. M8 ..12
Donora,Pa. A7 12
Duluth,Minn. A7 12
Fairfield,Ala. T2 12
Johnstown,Pa. B2 12
Joliet,Ill. A7 12
Kokomo,Ind. C16 12
Minnequa,Colo. C10 (45).12
Monessen,Pa. P7 12
Pittsburg,Calif. C11 13
Portsmouth,O. P12 13
Rankin,Pa. A7 12
So.Chicago,Ill. R2 12
SparrowsPt.,Md. B2 12
Sterling,Ill.(1) N15 12
Torrance,Calif. C11 14
Worcester,Mass. A7 13

TRACK BOLTS (20) Treated
KansasCity,Mo. S5(46)..9.8
Lebanon,Pa. (31) B2 ...9.8
Minnequa,Colo. C10 ....9.8
Pittsburgh P14 .....9.8
Pittsburgh O3 .....10.6

AXLES
Ind.Harbor,Ind. S13 ....5.6
Johnstown,Pa. B2 .....5.6

TIE PLATES
Fairfield,Ala. T2 .....4.77
Gary,Ind. U5 .....4.77
Ind.Harbor,Ind. I-2 ....4.77
Lackawanna,N.Y. B2 ..4.77
Minnequa,Colo. C10 ....4.92
Pittsburg,Calif. C11 ..4.92
Seattle B3 .....4.92
Steelton,Pa. B2 .....4.77
Torrance,Calif. C11 ...4.92

JOINT BARS
Bessemer,Pa. U5 .....4.92
Fairfield,Ala. T2 .....4.92
Ind.Harbor,Ind. I-2 ....4.92
Joliet,Ill. U5 .....4.92
Lackawanna,N.Y. B2..4.92
Minnequa,Colo. C10 ....5.07
Steelton,Pa. B2 .....4.92

STANDARD TRACK SPIKES
Ind.Harbor,Ind. I-2, Y1.6.65
KansasCity, Mo. S5 ....6.90
Lebanon,Pa. B2 .....6.65
Minnequa,Colo. C10 ....6.80
Pittsburgh J5 .....6.65
Seattle B3 .....7.15
So.Chicago, Ill. R2 ....6.65
Struthers,O. Y1 .....6.65
Youngstown R2 .....6.65

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.65-1.66
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025
9	3.25	0.5	....	1.01

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base
(13) Add 0.50c for 17 Ga. & heavier.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated
(21) New Haven, Conn., base
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators to consumers, 5.05c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c fo universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60' & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb
(43) Plus 4.7% on base an extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.
(46) Plus 2.2 per cent.

TTWELD STANDARD PIPE, T & C

Carload discounts from list, %

—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
Per Ft.	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c							
nds Per Ft.	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
uippa, Pa. J5 (‡) ...	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25						
n, Ill. L1 (†)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5						
wood, W. Va. W10 ..	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
a, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75						
tana, Calif. K1 (†) ..	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75						
Harbor, Ind. Y1 (†).	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75						
ain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25						
ron, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75						
rrows Pt., Md. B2 ..	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
ngstown R2 (**)	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25						
ngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
eatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

AMLESS STANDARD PIPE, T & C

Carload discounts from list, %

—Inches	2		2½		3		3½		4		5		6	
Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
nds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
quippa, Pa. J5 (‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
bridge, Pa. N2 ..	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
ain, O. N3 (*) ..	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
ngstown Y1 (‡) .	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ECTRIC WELD STANDARD PIPE, T & C

ngstown, R2 (**)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

TTWELD STANDARD PIPE, T & C

Carload discounts from list, %

—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
t Per Ft	5.5c		6c		6c		9.2c		$1.09													
lunds Per Ft	0.24		0.42		0.57		9.20		10.89													
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv												
nwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25												
tler, Pa. F6 (†) ..	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....												
na, Pa. N2 (†)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25												
aron, Pa. M6 (‡) ..	29.5	—1.75	23	+2.25	18	+5.25	..	....	..	....												
aron, Pa. S4 (†) ..	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....												
arrows Pt., Md. B2.	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....												
ungstown R2 (**)..	....	....	....	....	....	....	33	15.75	33	15.75												
heatland, Pa. W9 ..	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....												

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (**), 11.50c; (*), , with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

D.	B.W.	Seamless		Elec. Weld	
n.	Gage	H.R.	C.D.	H.R.	C.D.
.....	13	14.19	16.71–17.77	16.20	16.20
¼ ...	13	16.97	19.80–21.26	16.46	19.19
..	13	18.22	18.77 22.08 22.82	18.19	21.41
..	13	20.35–21.35	24.92–25.49	20.69	24.35
..	13	22.81–23.93	27.94–28.58	23.19	27.28
¼ ...	13	25.69–26.66	31.38–32.18	25.84	30.42
¾ ...	12	28.40–29.36	34.55–35.58	28.46	33.50
½ ...	12	31.28–32.17	37.83–39.19	31.19	36.67
¾ ...	12	33.87–34.82	40.09–42.44	33.05	38.86
.....	12	35.78–36.87	42.11–44.93	34.98	40.82

OLTS, NUTS

ARRIAGE, MACHINE BOLTS

F.o.b. midwestern plants; er cent off list for less than ase lots to consumers) in. and shorter:

½-in. & smaller diam.	11
⅝-in. & ⅝-in.	15
¾-in. and larger ...	14
onger than 6 in.:	
All diams.	8
ag bolts, all diams.:	
6 in. and shorter ...	19
over 6 in. long	16
Ribbed Necked Carriage	15
Blank	30
Plow	30
Step, Elevator, Tap and Sleigh Shoe	18
Fire Bolts	8
Boiler & Fitting-Up Bolts	28

NUTS

H.P. & C.P.	Reg.	Hvy.
Square:		
½-in. & smaller	10	10
⅝-in. & ⅝-in. .	8	1
¾-in.-1½-in. ..	4	+4
1⅝-in. & larger	22	1
H.P. Hex.:		
½-in. & smaller	12	+3
⅝-in. & ⅝-in..	8	+3
¾-in.-1½-in. ..	4	+3
1⅝-in. & larger	4	+3
C.P. Hex.:		
½-in. & smaller	22	18
⅝-in. & ⅝-in. .	19	13
¾-in. & 1½-in. .	15	8
1⅝-in. & larger	2	+4

EMIFINISHED NUTS

American Standard

Per cent off list for less han case or keg quantities)

	Reg.	Hvy.
½-in. & smaller..	33	26
⅝-in. & ⅝-in. ..	27	19
¾-in.-1½-in.	21	11
⅝-in. & larger..	5	list
		Light
⅛-in. & smaller	33	

½-in. to ⅝-in. 26
¾-in. to 1½-in. 18

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	37
1 in. and smaller diam. x over 6 in.	24

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller ...	34
¼-in. diam & larger ..	14
N.F. thread, all diams..	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish .....47.5 & 10	
Plated finishes .....30 & 10	

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	40
¾-in. through 1 in. ..	26
Longer than 6 in.:	
⅝-in. and smaller	24
¾-in. through 1 in. ..	2

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh; f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.50c
⅞-in. under .....40 off

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	10.90
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+ % Fe)	36.50
Unannealed (99+ % Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns .83.00-148.00	
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots.	78.00
Brass, 20-ton lots.	30.00-39.00
Bronze, 10-ton lots 52.25-60.00	
Copper:	
Electrolytic	45.75
Reduced 12.75*	
Lead	7.50*
Magnesium 75.00-85.00	
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	48.50
Silicon	38.50
Solder	8.50*
Stainless Steel, 302 ..	87.00
Zinc, 10-ton lots.	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over ...	5.35
Less than 1000 lb ..	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

* Plus cost of metal.

STAINLESS STEEL

(Add 4.7% to extras where new extra cards have not been issued)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	44.25	36.50	33.75
302...	44.50	39.75	34.00
303...	46.50	43.50	36.50
304...	46.50	41.75	35.50
309...	60.50	59.25	48.25
316...	61.50	63.50	53.00
321...	53.00	52.00	40.00
347...	58.00	56.50	44.75
410...	39.00	32.75	27.50
416...	40.00	40.00	28.00
420...	47.00	50.25	33.50
430...	41.50	33.25	28.00
501...	29.25	27.75	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416 420, 501 & 502 A10

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.7% increase.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501 502 and 34.25c on Type 301 S3.

So. Chicago, bars, shapes U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, strip A4.

Youngstown, strip C8.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Copper Base Both Sides
302	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	.....	....
310	36.50	41.00	....	.....	144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	.....	....
318	33.50	38.00	....	.....	....
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	.....	....
410	20.75	27.25	....	.....	....
Nickel .	33.55	45.15	....	.....	....
Inconel .	41.23	54.18	....	.....	165.00
Monel .	34.93	46.28	....	.....	....
Copper*	....	....	....	44.00	....

	Strip Carbon Base Cold-Rolled 10%	Strip Carbon Base Cold-Rolled Both Sides	Strip Carbon Base Hot-Rolled 10%	Strip Carbon Base Hot-Rolled Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatsville L7; nickel. copper-clad strip, Carnegie, Pa. S18 Production point for copper-base sheets is Carnegie, Pa. A13.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	5.81	7.17	7.38	6.42	...	6.41	7.43	11.27	6.47	6.47	7.70
Boston	6.51	7.35	8.39	6.55	...	6.42	7.49	12.37	6.56	6.75	7.98
Buffalo	5.80	6.65	8.31	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70[2]	5.80	...	5.80	7.85	...	5.95	6.10	8.15
Chicago	5.80	6.65	7.90	5.83	...	5.83	6.80	10.65	5.95	5.95	7.18
Cincinnati	6.13	6.72	8.21	6.14	...	6.13	7.16	10.97	6.42	6.47	7.60
Cleveland	5.80	6.65	8.04	6.00	...	5.89	6.90	10.79	6.28	6.12	7.51
Detroit	6.23	6.46	8.44	6.08	7.495	6.12	7.10	10.92	6.42	6.47	7.62
Houston	6.74	...	8.65	6.89	...	6.98	...	...	6.82	6.78	8.16
JerseyCity,N.J.	6.26	7.27	8.32	6.56	...	6.59	7.53	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	8.45	6.75	11.20	6.60	8.60	12.05	6.60	6.70	8.90
Milwaukee	5.97	6.82	8.07	6.00	...	6.00	7.07	10.82	6.12	6.12	7.35
Moline, Ill.	6.16	7.00	8.25	6.19	...	6.18	7.16	...	6.30	6.30	...
New York	6.26	7.37	8.32	6.56	...	6.69	7.63	11.14	6.49	6.70	8.11
Newark, N. J.	6.62	7.41	8.53	6.56	...	6.59	7.71	...	6.39	6.60	7.18
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia	6.16	7.18	7.70	6.50	8.30	6.47	7.50	10.89	6.22	6.29	7.42
Pittsburgh	5.80	6.65	7.90	5.94	...	5.83	6.66	10.65	5.95	5.95	7.18
Portland, Oreg.	7.80	9.05	9.30	7.50	...	7.25	9.40	...	7.25	7.05	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.63	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.20	6.14	...	6.13	7.20	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.56	6.50	...	6.49	7.57	...	6.61	6.61	7.84
San Francisco	6.90	8.20	9.45	6.75	...	6.65	8.40	12.00	6.50	6.75	8.90
Seattle-Tacoma	7.36	8.24	9.40	7.45	...	7.08	9.37	12.00	6.83	7.19	9.10
Spokane (city)	7.80	9.40	10.15	7.15	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gag extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [5]—1000 to 1999 lb.

Advances in Warehouse Steel Prices Pend

Distributors will revise their schedules upward in line with action taken by mills in lifting extras on certain products, including bars and sheets

Cleveland—Some upward adjustments in warehouse steel prices are being effected to reflect increases in mill extras on certain products, such as bars and sheets, now being put into effect.

All distributors haven't taken action since some are without word from their mill supply sources as to policy, but several have announced increases averaging $3 on hot-rolled and $4 on cold-finished carbon bars. One leading seller now quotes hot-rolled at $6.04 against $5.89 formerly, and $7.10 against $6.90.

Word is expected to come through from the mills of increases in extras on sheets and other products shortly, and the warehouses indicate these will necessitate corresponding adjustments in their base prices.

Demand on the distributors continues strong with prospects promising for substantial order volume through June. May business is holding up well compared with that in April and March, though in some products volume may be down slightly due to limited stocks. Sellers say they could dispose of much larger tonnages of sheets and structurals were they available.

Warehouse inventory position continues to improve, but stocks still are unbalanced and consumers must shop around to fill all their needs.

Philadelphia — Revisions in mill extras on carbon bars and sheets should be reflected soon in higher warehouse price schedules. Some distributors have already taken initial action.

Sellers anticipate another good month in May, but whether the daily rate will be up to the high level of April and March remains to be seen. An encouraging aspect is the improved warehouse inventory situation. Not only are stocks heavier, but they are in better balance. This should help facilitate business. However, stocks have some way to go before reaching normal.

Boston — Finished steel products moving to warehouses are in generally more satisfactory volume, but distributors' receipts of desired products still are restricted. The mills still tell the warehouses what they can buy in numerous products. Consequently, the distributors are experiencing difficulty in placing enough specification volume.

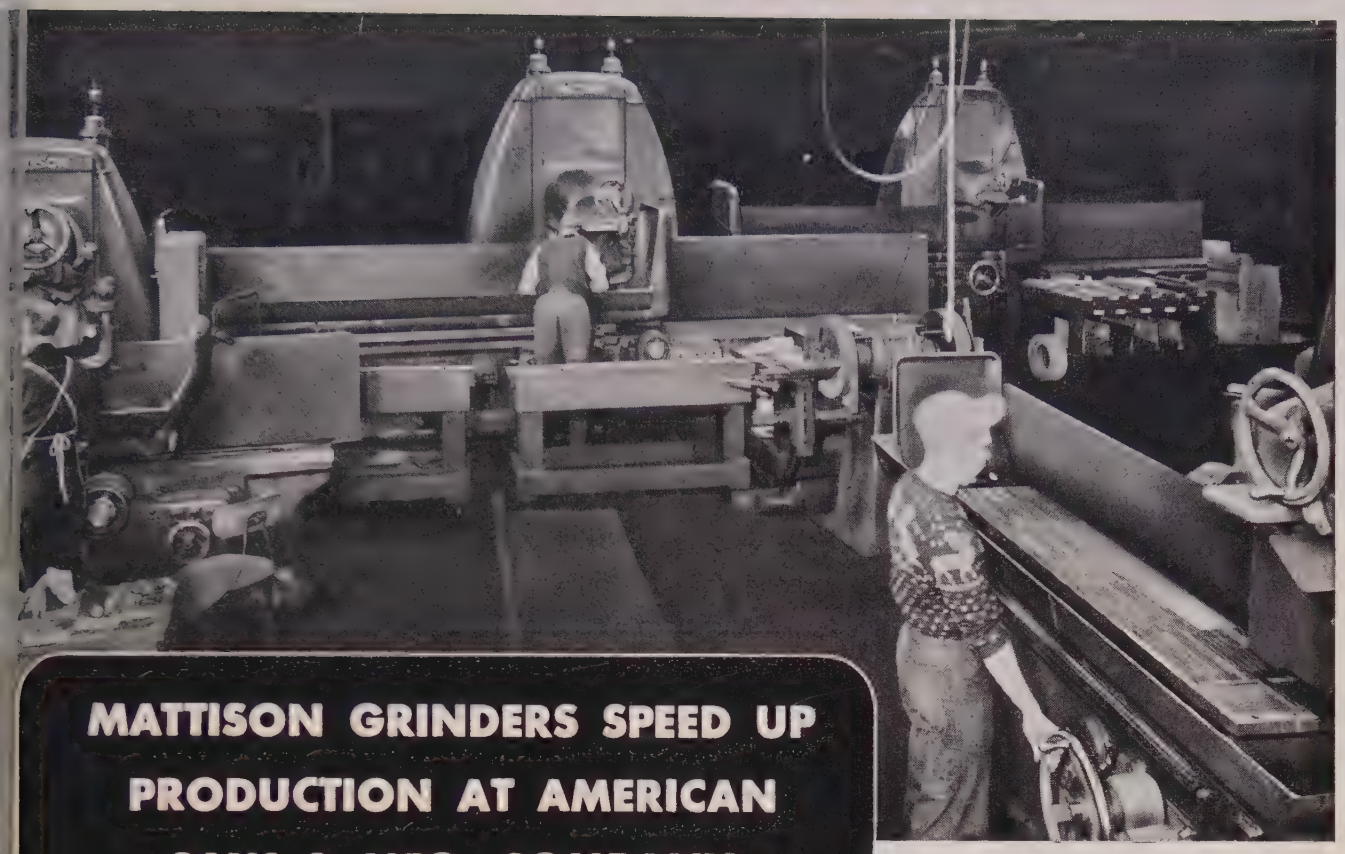
Demand on the warehouses continues brisk with stocks sufficient to meet somewhat smaller requirements in cold-finished bars, floor plates and galvanized sheets.

Cincinnati—Warehouses here may be forced to change their prices upward to reflect mill increases in extras. There is no let-up in demand for sheets nor in tightness of inventories. The big question is what will happen after controls go out June 30. Some warehousemen claim they see less tonnage in sight; others say the outlook is so confused they will not guess as to what will happen.

Chicago — Demand for steel from warehouses holds strong and is regarded as for current rather than backed-up needs. Some progress continues to be made in inventory building and, while impressive in aggregate tonnage, it doesn't fall in the categories where demand is strongest.

Los Angeles—Fabricators' prospects of obtaining warehouse steel grow progressively better. Movement of steel from mill—to distributor—to fabricator is at a rapid clip. Balance between distributors' supplies and fabricators' needs tonnage-wise is fairly even as fabricators restrict orders to day-to-day requirements.

Seattle—Demand for warehouse items is maintaining seasonal levels although the strike in the metal working industry is being acutely reflected in order volume. The situation is not so bad at Portland where some shops have resumed work. Plates and sheets continue tight and little early relief is seen.



MATTISON GRINDERS SPEED UP PRODUCTION AT AMERICAN SAW & MFG. COMPANY

● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

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POWER TRANSMISSION
On the BIG JOBS

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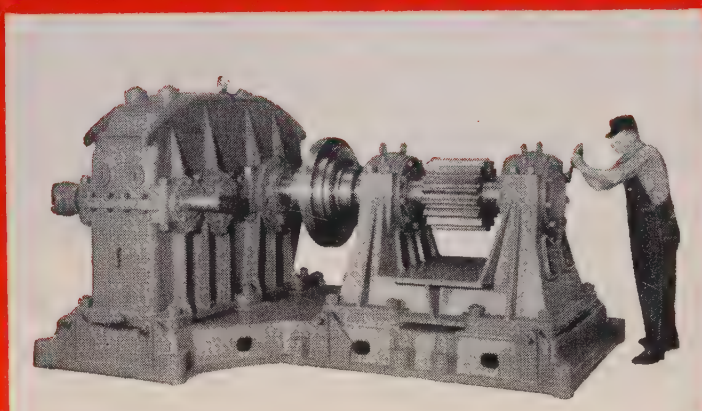
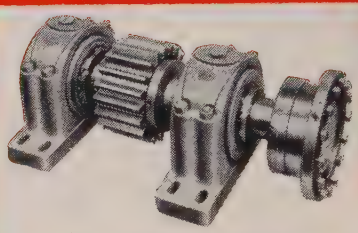


Cement Kiln Drive

JONES Products—*While specifically* designed for the heavy industries — *are competitive for all applications.* All the added values of sturdier design, heavier construction and better materials are yours without extra cost.

Ask for Bulletins



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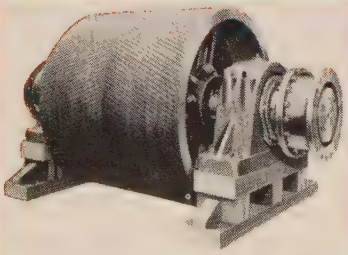
HERRINGBONE WORM GEAR WORM HELICAL

PILLOW BLOCKS to 9" Shaft Size

Timken Equipped, Adaptor Sleeve Type
Self-Aligning, Dust-Tight
Sizes to 4-15/16" in Stock



Jones 60" x 57" Rubber Covered Pulley mounted on 9" Jones Timken Pillow Blocks

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CUT GEARS

to Your Specifications

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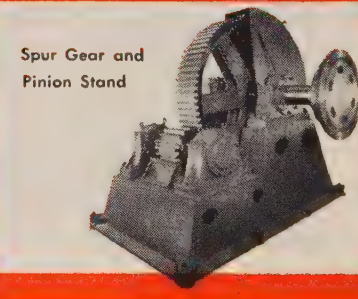
HELICAL - BEVEL - SPUR



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In The Service Of Industry

ome Sheet Extras Are Being Raised

Jones & Laughlin's adjustments in hot-rolled and cold-rolled cards are seen as setting market pattern. Other makers studying price structures

Sheet and Strip Prices, Page 163 & 164

Pittsburgh — Action of Jones & ughlin Steel Corp. in increasing tain extras on hot and cold-rolled ets is seen as setting the pattern the market. Expectations are er producers will not be long in king similar announcements.

The Jones & Laughlin revisions, ich became effective Apr. 25, are gely in size extras, and are unstood to range from $1 to $2 per n. The new extra lists replace those effect since. Dec. 1, 1950.

That somewhat similar action will taken by other producers is seen statements by various company rectors to the effect higher charges e needed to offset increased costs. Benjamin Fairless, chairman, U. S. eel Corp., last week said that while general increase in base prices is ntemplated at this time, U. S. Steel ans to make certain changes in tras, the extent of such revisions w being under consideration.

Speaking to the shareholders of ungstown Sheet & Tube Co. last eek, J. L. Mauthe, president, said e steel industry needs higher prices, at earnings are being unfavorably fected by unsound relationship beeen costs and prices, the plain fact ing that steel prices have failed keep pace with costs. He added at the company is giving serious udy to its price structure. Apparntly plans are being formulated to crease prices through adjusting me extras.

Further tightening is anticipated stainless and alloy sheets as reult of the temporary closing down f the Brackenridge plant of Alegheny Ludlum to permit completon of the installation of a new hot ill. While the closing is of short uration, it will be reflected in lightly later delivery dates for some roducts.

Conversion tonnage continues rominent in the sheet market with uto demands continuing to press on roducers. No relief is in sight for ght supply conditions over the next everal months.

Cleveland—Sheet market is highghted by action of a leading Pittsurgh producer, Jones & Laughlin teel Corp., in effecting increases in ize and length extras, which, it is nderstood, average $1 to $2 per on.

In some respects, upward adjustments in extras at this time are taking the consuming trade by surprise. While revisions were expected, it generally had been thought these would be delayed until pending steel wage negotiations were out of the way, probably some time late in June.

Meanwhile, demand for hot and cold-rolled sheets never was stronger.

Carryover from second to third quarter will be so substantial some mills are planning on blanking out at least one month to care for the overflow.

Boston—Diversified factors involving production and distribution are building up toward continued critical carbon sheet supply through third quarter. One leading producer, not expected to be in the clear before May 10 as to available third quarter tonnage, is asking for cancellations in June, both warehouse and converter volume included.

In other cases June shipments will go into July with the latter month blanked out for new orders. Other producers are guarding against overloading schedules, reducing numerous individual allotments to spread available tonnage. Some are out of New England, except for finished flat-rolled on which margins are satisfactory.

Narrow cold-rolled carbon strip orders are pouring in for third quarter. Much of this tonnage appears to be anticipatory buying giving the market a strong appearance for the immediate future.

Meanwhile numerous consumers are in need of cold and hot-rolled carbon grades well ahead of promised shipments and demand for foreign sheets has increased sharply.

New York—Other sheetmakers are expected to take action on sheet extras similar to that announced last week by Jones & Laughlin Steel Corp., Pittsburgh. The revisions, effective Apr. 25, affected extras on size, including gage, width and length and quality; also quantities from 40,000 pounds down to and including 10,000 pounds.

Philadelphia — Jones & Laughlin Steel Corp. has issued new sheet extras, effective Apr. 25. This action is seen as a likely forerunner of what may be exepected of other sheetmakers.

Currently, sheet demand continues highly active with virtually all mills oversold for the second quarter on hot and cold-rolled material, to say nothing of certain specialties. It ap-

Bethlehem's Huge Ladle Rides the Pennsy

Towering above the diesel switcher, this 30-ton upper section of an open-hearth ladle traveled via Pennsylvania Railroad's heavy duty lines from Bethlehem, Pa., to Bethlehem Steel Co.'s plant at Sparrows Point, Md. This massive fabrication weighs 60,160 lb, stands 15 ft 9 in. above the rails and has a maximum width of 10 ft 2 in. Eighteen of these ladles, having a capacity of 265 tons each, will be installed as part of an expansion program

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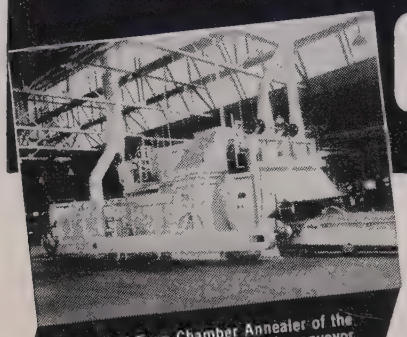
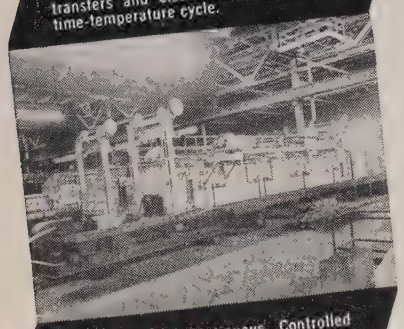
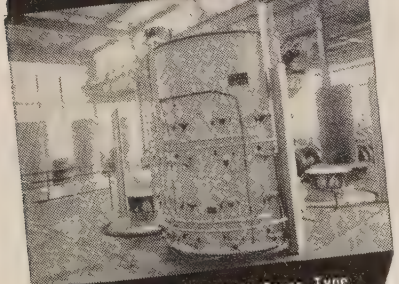


Continental Twin-Chamber Annealer of the recirculating type with automatic conveyor transfers and close-tolerance control for time-temperature cycle.



Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor systems.

Continental Stamping Annealer, continuous roller rail type, complete with baskets, handling convevors, and automatic controls for work handling and temperature cycles.



Six Continental "Top Hat" Cover Type Furnaces for bright annealing high-carbon steel, complete with gas generator and automatic controlled time-temperature cycling.

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CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and installation of the equipment including necessary work-handling accessories and control devices—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

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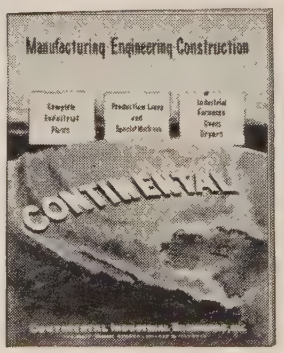


PLANNED MILITARY PRODUCTION
Write for Booklet No. 127

FURNACES
PRODUCTION LINES
CONTINENTAL
SPECIAL MACHINES
COMPLETE PLANTS
MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY

pears likely that they will be abl to supply little new unrated tonnag before August on the two majo grades, also on electrical sheets an enameling stock.

Special quality galvanized shee appear in tight supply, somewhat i contrast to the situation with re pect to ordinary grades.

Army General Supply Office, thi city, will close on bids on May 15 a 2240 tons of flat steel strapping.

Cincinnati—Completion of a ne blast furnace in this district offer the prospect of more strip and sheet for customers in this area. No esti mate has been made on how muc additional output will be available Meanwhile, demand for these item continues as active as ever.

Chicago—Of all sheet items, onl galvanized schedules are not crowded Even electrical grades, which ha slowed slightly in interest recently have tightened again. It is the in tense demand from automobile build ers for both hot and cold-rolled tha augments strong interest from othe consuming fields to make sheets i tightest supply of all steel products It is obvious now there can be n clean up in second quarter of unde livered tonnage carried over from first quarter.

Los Angeles—Cold-rolled sheet head shortage lists in this district followed by plates, cold-finished bars and wide flange structural shapes With cold-rolled sheets tight, gra market operators are out in force quoting 2 to 3 cents per pound ove list with fair volume acceptance Galvanized sheets are abundant an are offered at 1 to 1½ cents pe pound below the established market

Tubular Goods . . .

Tubular Goods Prices, Page 165

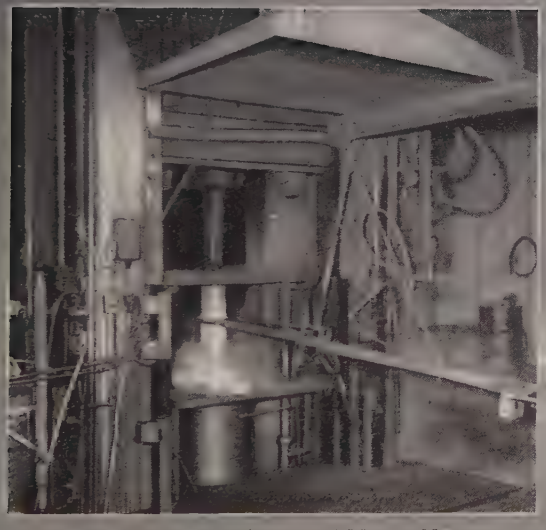
Boston—Tubular steel product vary in demand, and price. On th soft side is buttweld pipe. Distrib utors are turning down half of allot ments and shading through discounts Light carbon tubing is offered in suf ficient volume to soften the pric structure, although stainless deman is heavy.

Seamless pipe, 4 to 6 inches, i in short supply and all tonnage avail able is taken, both by distributor and on direct shipments.

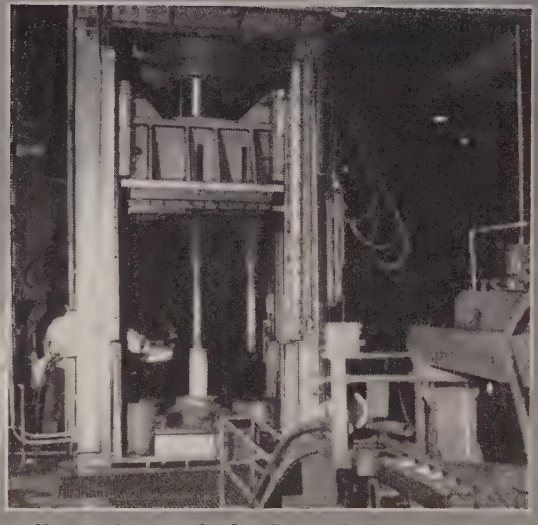
Pressure and mechanical tubing de mand is steady, but with earlie pressure off. Wrought iron pipe ha been slow this spring, but show spotty improvement.

Seattle—Increasing competition i noted in the cast iron pipe field. Bi calls as a rule ask for alternative A project at Renton, Wash., involv ing 350 tons of water mains, went t

MASS PRODUCTION of projectiles with Verson PRESSES AND TOOLING for greater production and lower costs!



Piercing a steel billet in a 600 ton Verson hydraulic press.



Here a Verson hydraulic push through press sizes the cavity and O.D. of the steel forging.

AMONG the many advancements in the press forming of metals that have been pioneered by Verson in recent years are new, improved presses and tooling for producing artillery projectiles. Under the pressure of a combination military and civilian economy, Verson methods have resulted in substantial savings in metal and have made possible great increases in output without a corresponding increase in critical manpower.

Equally important strides have been made in civilian production, too, but tremendous opportunities for modernization and increased efficiency remain. We would like to have the opportunity to discuss press forming of metals with you and help you set up a plan that will enable you to take advantage of the many cost cutting opportunities that are becoming available.

Write, today, outlining your requirements.

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Shear Blade Specialists Since 1891
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another type of pipe. Bids are in at Shelton, Wash., for 200 tons of cast iron. A large project at Hillsboro, Oreg., calling for about 1000 tons of water pipe if cast iron, may be awarded steel. Bids are in.

Tin Plate . . .

Tin Plate Prices, Page 163

Washington—Shipments of metal cans in February amounted to 252,084 tons, a decrease of 7 per cent from the preceding month, when 269,597 tons were shipped, and an increase of 7 per cent over the corresponding month a year ago, when shipments amounted to 235,648 tons according to the Bureau of Census, Department of Commerce.

Total shipments for the first two months this year were 521,681 tons, against 470,020 in the same period of 1952.

Of the 252,048 tons shipped in February, 151,200 went into food cans and 100,884 into non-food cans. During the first two months 318,964 tons went into food cans, against 288,436 in the first two months of last year; and 202,717 into non-food cans, against 181,584 tons.

Wire . . .

Wire Prices, Page 164

Boston — Most wire tonnage for second quarter covered by expiring control distribution tickets will be shipped, but shipment of some open-end volume accepted for that period is doubtful. Considering this carry-over and vacation disruptions, producers are cautiously booking orders for July shipment.

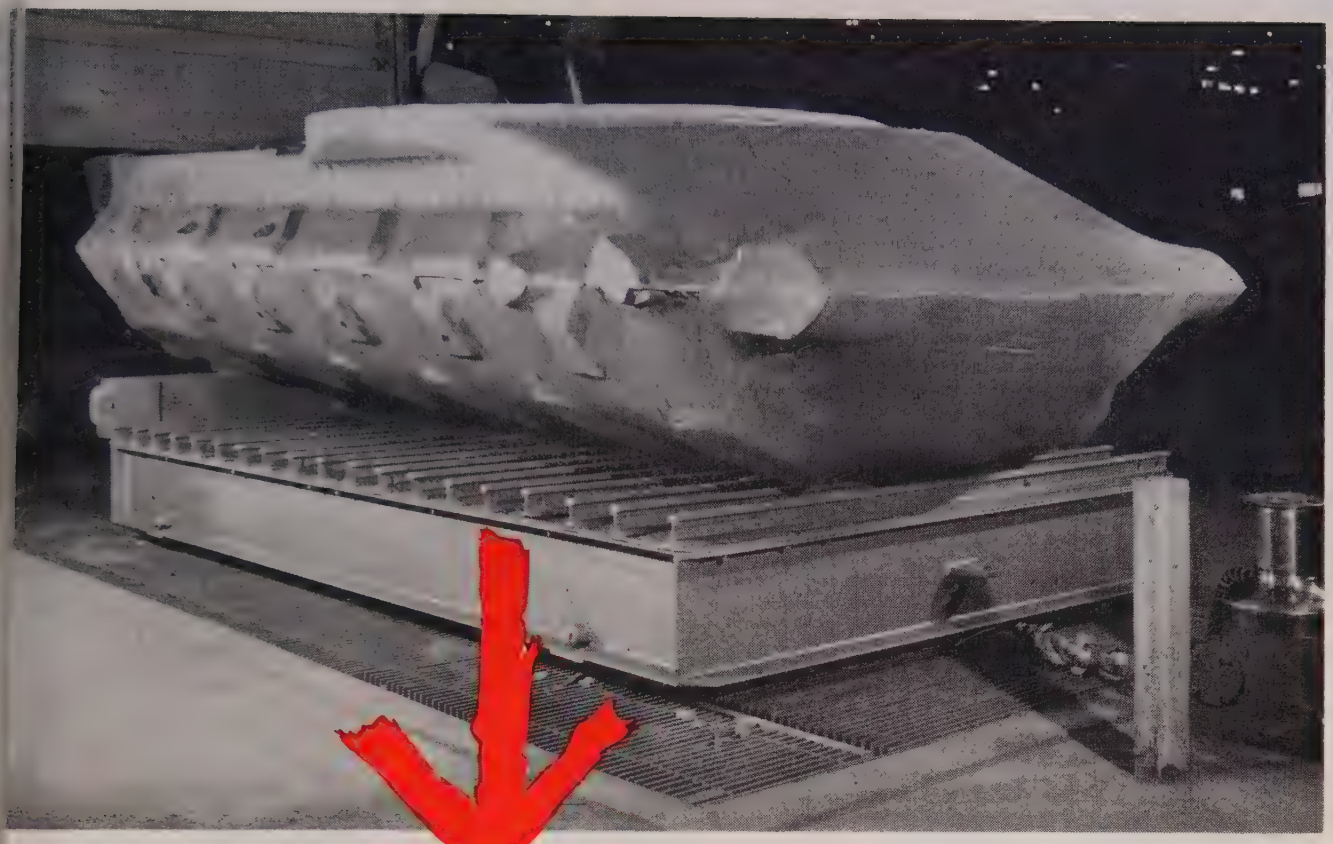
Nails and merchant wire products show some seasonal improvements in demand, but distributors are not buying far in advance due to ample supplies.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 165

Pittsburgh—Expect an increase in the price of some bolts and nuts, as soon as the industry has evaluated the amount of increase in the price of bar and sheet extras. Such increase probably will not come until after all basic steel producers have announced their new schedules of extras.

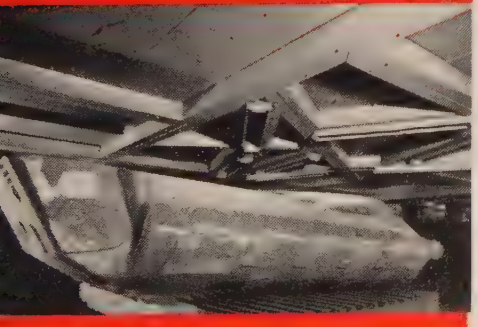
Bolt and nut producers are still confronted with a sagging market, and venture little in the way of optimistic predictions for third quarter. It is generally agreed some fastener customers have piled up good inventories on many sizes. Some of the larger sizes, however, are not yet in plentiful supply.



Mammoth tank castings cleaned in 40 minutes with a WHEELABRATOR® ROOM

AIRBLAST TIME: 7 to 9 hours with 2 operators

The Wheelabrator Room has 2 work cars, one at each end.



Interior of the Wheelabrator Room with the tank hull casting in blasting position.

Could you clean this mammoth cast steel tank hull in just 40 minutes? That's all it takes in the giant Wheelabrator Room (The world's largest airless abrasive blast cabinet ever built) installed in the ordnance division of a large steel foundry. To do this same job by air blasting would require 7 to 9 hours per casting using two operators. Savings effected by this installation are tremendous—in original equipment, labor requirements, floor space, compressed air costs, etc. A smaller Wheelabrator Room is used for cleaning smaller tank castings.

WHEELABRATOR HAS UNLIMITED APPLICATIONS

Look what you can do with a Wheelabrator: You can etch mill rolls, shot peen, deflash plastics, descale steel strip and sheets, clean castings and forgings, etc. What can a Wheelabrator do for you? Send now for Bulletin No. 74A.

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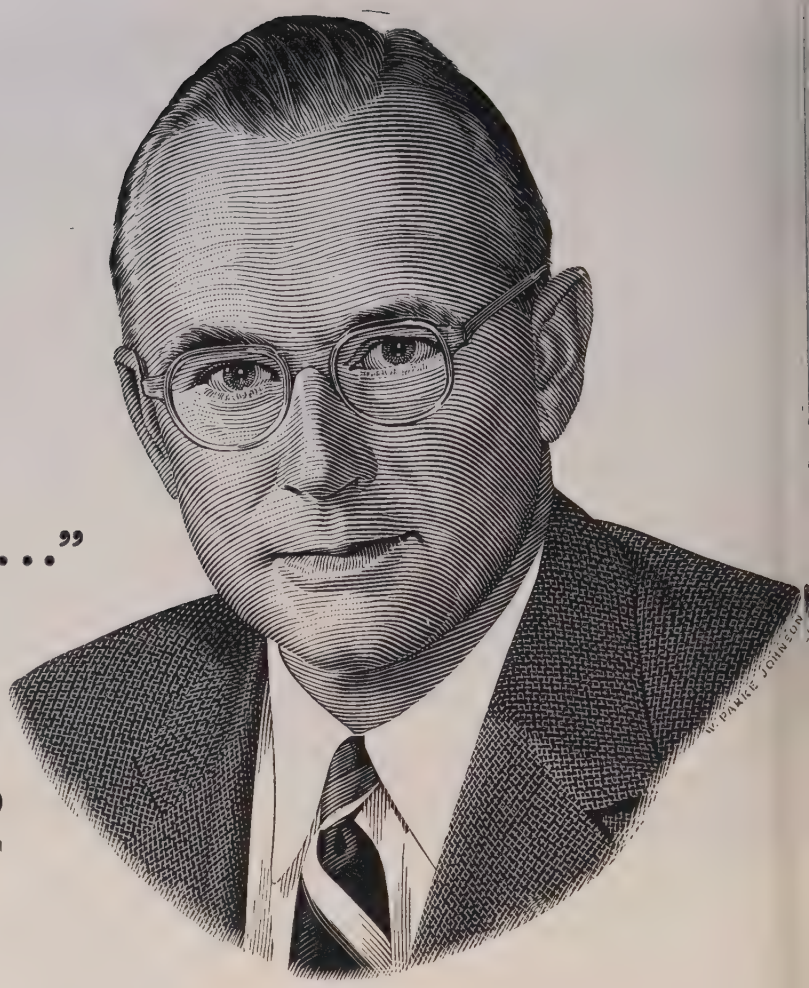

S. A. SWENSRUD
President, Gulf Oil Corporation

"I have no hesitation in saying I believe it is a sound thing for our industry to support the Government's Payroll Savings Plan and to encourage our employees to put at least a substantial part of their savings into U.S. Savings Bonds. Upwards of 80 per cent of all Gulf Oil employees save part of each pay in E Bonds. This type of thrift is good for the nation as well as for the individual."

At the close of 1952–

• Individual Americans owned Savings Bonds totaling more than $49 billion, cash value.

• Series E Bonds outstanding—the kind bought by Payroll Savers—were more than $600 million greater than on May 1, 1951, when the bonds issued in 1941 started to mature.

• Of the $4.8 billion Series E Bonds which matured between May, 1951, and December, 1952, more than $3.6 billion (75%) were held beyond maturity, under the automatic extension plan.

• More than 77 million units of Series E Savings Bonds were bought by individuals in 1952—13% more than in the previous year.

• During every one of the past 21 months, redemptions of unmatured Series E Bonds have been well under 1% of the total amount outstanding.

• 1953 figures should be even better—more than 1,000,000 Americans joined the Payroll Savings Plan in 1952, and thousands, literally, are enrolling every day.

• Never before in the history of this or any other country have employed men and women held a reserve purchasing power of $49 billion in government securities—a cushion against emergency, a check on inflationary tendencies.

If you believe with Mr. Swensrud that "it is a sound thing for industry to support the Payroll Savings Plan . . ." and ". . . this type of thrift is good for the nation as well as the individual," phone, wire or write to Savings Bond Division, U. S. Treasury Department, Washington, D. C. Your State Director will show you how your participation can be raised to 60%, 70% or even higher.

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STEEL
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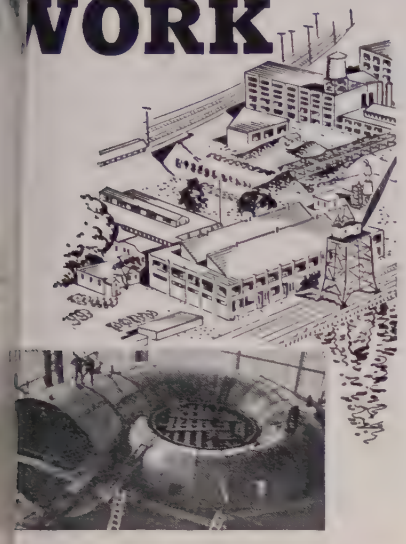
STEEL PLATE WORK



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PUSEYJONES

Steel Bars . . .

Bar Prices, Page 162

Cleveland — Expectations are that the recent increases in extras on hot-rolled and cold-drawn carbon bars announced by Republic Steel Corp. will be pretty generally followed by other producers. However, so far only a couple of the larger interests, other than Republic, have moved to effect new schedules, these including Bethlehem Steel Co. and Jones & Laughlin Steel Corp. Some makers are said to be holding up revisions pending clarification of the outlook with respect to wage demands by the union.

Currently, demand appears as strong as ever for the larger sizes with prospects for continued pressure through the remainder of the year for tonnage on military account. Automotive requirements still show no sign of slackening.

Boston—While viewing an increase in carbon bar prices through extras untimely, several producers are considering similar action. Announced extras in cold-finished average somewhat heavier than for hot-rolled, $8 to $9 where grinding and other extras are included. For magnetic testing, extras include limitations on specifications to be so tested, thus reducing mill rejects. Only improvement in carbon bar supply is in smaller cold-finished. Shell directives for large bars are higher, notably at Buffalo. Alloy bars are being booked for July. Open hearth alloys are becoming more extended.

New York—Independent producers are expected to announce revisions in cold-drawn carbon bar extras shortly, revisions conforming pretty much with those recently put into effect by several leading interests.

Bar business continues brisk in hot and cold-drawn bars, both carbon and alloy grades. Greatest pressure is for the large sizes of hot carbon bars, and perhaps the least, although still good, for the small sizes of cold-drawn carbon.

Philadelphia — Although not all sellers of hot and cold-drawn carbon bars have revised their extras upward, enough have followed the recent move of Republic Steel Corp., at least in most respects, to indicate a general upward trend in extras.

These changes should be reflected shortly in warehouse prices.

Demand continues well in excess of supply, with the situation further tightened by the total suspension of ingot operations at one openhearth department of the leading producing interest at its Homestead Works. A large part of the output of this works went into bars.

Pittsburgh—Jones & Laughlin's an-

MUNDT PERFORATED METAL MEANS PERFECT SCREENS

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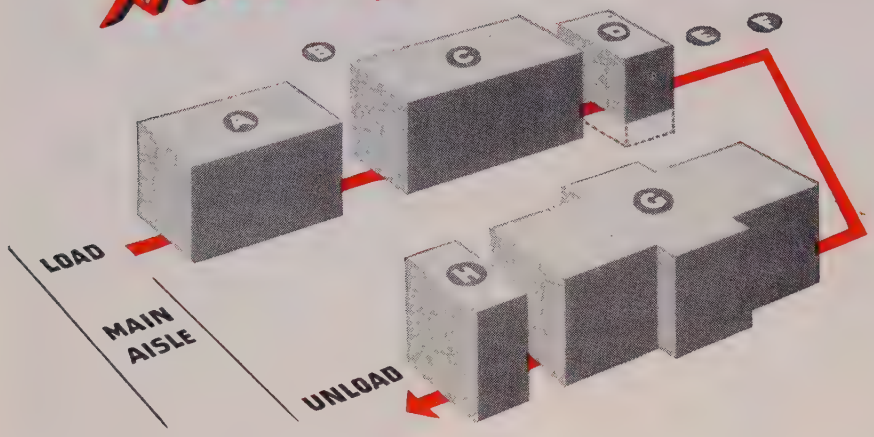
Heat Treat Furnace Layout by Holcroft... 1st of a Series



- A Direct gas-fired normalizing furnace
- B Controlled cooling zone
- C Direct gas-fired hardening furnace
- D Quench tank and elevator for oil or water
- E Drain section
- F Transfer (and tip over) from drain section to draw furnace
- G Indirect gas-fired draw furnace
- H Tip-over at discharge end of draw furnace

"Pinch-Hit" Unit backs up 5 Heat Treat Furnaces...

A new furnace layout—designed to bat for five existing furnaces—handles overflow production, replaces any furnace down for repairs, and has the extra capacity for treating war-production forgings of special alloy steels.

Designed by Holcroft, the unit as laid out above, is the buffer behind existing furnaces which normalize, anneal, harden-quench-draw, normalize-harden-quench-draw, or cycle anneal the forging production. A "U-type" layout puts both charge and discharge ends of the unit on a main trucking aisle to simplify material routing.

This is custom engineering at its finest—the type that studies *your* problem and develops the right furnace, or combination of furnaces, for the job. Cost? Let's be realistic: more, perhaps, for a Holcroft furnace—*but much, much less per heat-treated piece.* Write today for more information. Holcroft & Company, 6545 Epworth, Detroit 10, Michigan.

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EUROPE — S. O. F. I. M., Paris 8, France

nouncement of an increase in the price of extras on carbon bars has heightened belief that other producers in this area will soon follow.

Jones & Laughlin's increase amounts to a little more than $5 per ton for hot-rolled bars; slightly under $10 for cold-finished bars.

Cincinanti—Alloy bar prices have not gone up at the mill level but an increase is expected since a price hike in extras has been applied to carbon bars. Mill shipments of alloy bars remain unchanged.

Chicago—Until automobile makers trim down their requirements for bars, only demand in excess of output can be seen. There is no indication of a turning point yet. Currently, farm equipment builders are reappraising their needs upward. Carryover from second quarter into third quarter is going to be substantial.

Bliss & Laughlin Inc. last week announced adjustments in its lists of extras for cold-finished carbon steel bars and shafting, effective Apr. 30. The changes generally reflect recent increases in costs of raw material and other items used in the manufacture of bars.

Rails, Cars . . .

Track Material Prices, Page 164

New York—Colorado Fuel & Iron Corp. has advanced base prices on rails $6 per ton and on accessories $3 a ton. Other leading rail producers may take similar action as they have long regarded prices as too low.

Reaction of some railroads to this latest price announcement is that they would be willing to pay more if it means they will be able to obtain more tonnage than they have been getting over the past few years.

Renewed buying of rails would soon be reflected in heavier demand for tie plates, spikes and other accessories, demand for which has been lagging badly for some time.

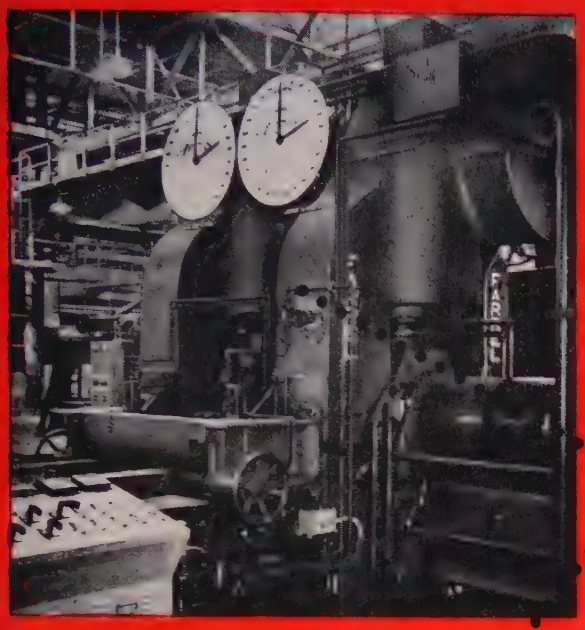
The new schedule of Colorado Fuel & Iron, effective Apr. 28, quotes No. 1 rail at $81.50, No. 2 at $79.50, tie plates at $98.50, joint bars at $101.50, and spikes at $136.

Iron Ore . . .

Iron Ore Prices, Page 181

Cleveland—Ore is moving from the head of the lakes at increasing pace. In the week ended Apr. 27, the lake fleet brought down 2,518,992 tons. This was the best weekly movement to date this season.

Shipments this season to Apr. 27 total 7,214,621 tons, according to the Lake Superior Iron Ore Association. This compares with 5,280,232 tons in the like 1952 period.



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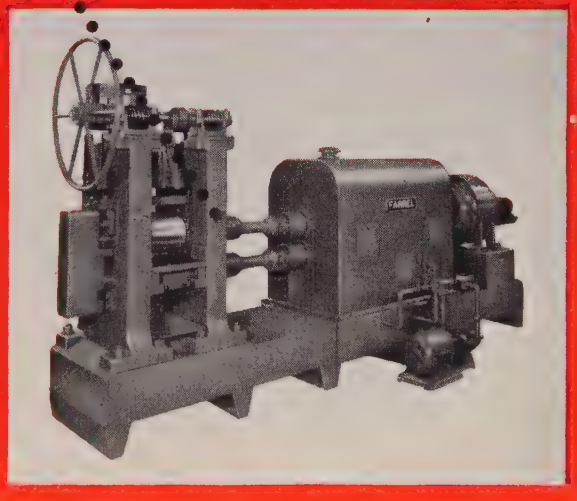

For almost a century, Farrel mills have been helping to solve rolling mill production problems. Designed to meet specific requirements, they are built in a wide range of types and sizes for rolling nonferrous rods, strips or sheets, as well as metal foils and cold strip steel. The company also designs and manufactures the reduction gear drives and pinion stands, coilers and special handling equipment required to make each installation a complete unit.

Farrel engineers are prepared to design mills for the solution of your production problems.

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Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed, $252; less gross ton lots, packed $269; f.o.b. Sheridan, Pa., Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, Philo or Marietta, O., Lynchburg, Va. Base price: $227, Johnstown, Pa.; $228, Etna, Pa.; $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C. 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 30c; ton lots, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max. Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.60c per lb contained Cr, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb of contained Cr, C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained silicon plus 16.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max 0.50% ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c; prices on 0.10 per cent carbon grade, C grade, $1.12 per lb of contained chromium, up 4c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max Al 0.50% max, C 0.50% max). Contract 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr, 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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This is the kind of duty that Bristol Brass men understand so well. They, too, have a name for "always being on the job" . . . and they won't stand for the smallest nick in that name . . . if determination, brains and resourcefulness can help it. *And they have plenty of all three.* Try Bristol Brass service on your own sheet, rod and wire needs. You may encounter *two* new experiences . . . in quality, as well as in service.

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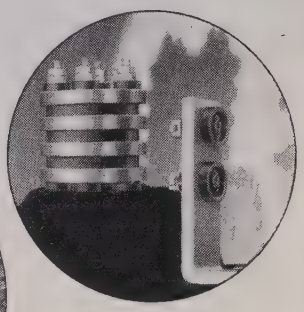
Collector Rings



Wesche Collector Rings are available in many standard designs and sizes. More typically, we are called upon to design and build custom rings for a specific application.

Collector rings serve to complete electric circuits between stationary and revolving parts such as heated rolls, revolving platforms or cranes and rotating machine parts. Wesche Rings are bronze, insulated from each other with phenolic or fibre. Required number of terminals extend from one or both ends. Two to more than 40 rings may be assembled into a unit rating from fractional to more than 200 amperes. Up to 48" diameter.

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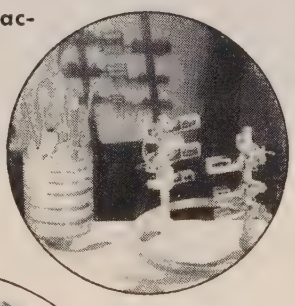

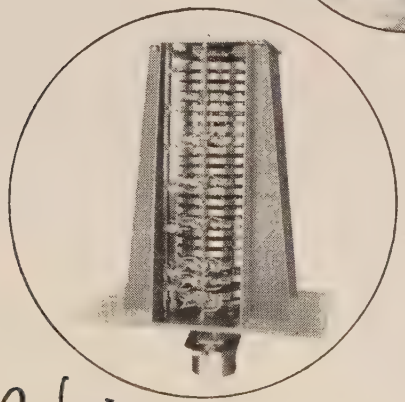

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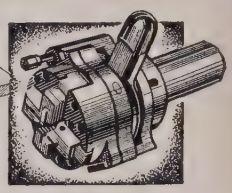

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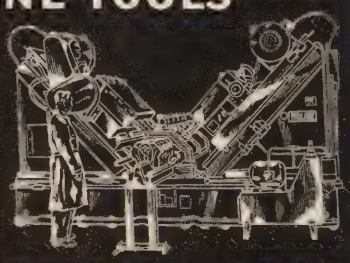

Boring V-8 Engine Cylinders

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in Italic.

ORES

Lake Superior Iron Ore

Prices effective for ore delivered up to and including June 30, 1953; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.10
Old range nonbessemer	9.95
Mesabi bessemer	9.85
Mesabi nonbessemer	9.70
Open-hearth lump	10.95
High phosphorus	9.70

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates on contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$55.00
Domestic scheelite, mine	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90c-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines $1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F*: Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa. $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St., Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.
60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.
70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar, Tex. ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $35-$36.

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Plates . . .

Plate Prices, Page 162

New York—Ship plate requirements are off somewhat. Both ship construction and maintenance are tapering, and while the yards haven't too much in the way of inventories, they are exerting less pressure on the mills. However, the over-all plate picture remains good. Boiler and tank makers, particularly boiler shops, are seeking far more tonnage than they are able to obtain. Within the past week two platemakers, which have been forced to delay action, opened books on commercial tonnage for shipment beyond end of this quarter on a monthly basis. One of these mills has had to blank out July entirely, except for work requiring magic numbers, which has meant that the earliest it can do in the way of new non-rated business is August.

Boston—Light gage plates are tightening again. One mill supplying substantial volume, one-half inch and under, has withdrawn. Slack is not being taken up by others, including strip mills producing light and narrow plates. Excess primes are offered less frequently and fabricating shops, with small inventories, are gearing operations to the volume available. Heavy and wide material has not eased and producers are booked into third quarter as far as they want to go. Most fabricators of plates have been unsuccessful in placing anything but ticket tonnage for second quarter.

Philadelphia—While plate producers are studying price schedules with a view to possible changes, no revisions have yet been announced. Actually no changes in base prices are expected for at least several weeks, if then, apart possibly from those of one or two high premium producers, and revisions with them, it is thought, may be on the downside rather than the upside.

Extras may come in for fairly early change, especially as they affect the light gages. Some consumers of boiler quality plate in ¼ and 3/16-inch thickness, indicate they might be willing to pay a little more in the way of gage extras if such meant they would get more tonnage. Certain producers limit the amount of light plate they will accept on an order to 25 per cent.

Pittsburgh—Steel plate producers in this district will feel the effect of the demise of U. S. Steel's No. 3 open hearth at Homestead. A considerable tonnage from this shop went into plates. However, all products of the company are sharing the loss. Each customer will feel some additional supply tightening which will be in direct proportion to the extent of his orders prior to the closing.

Seattle—Several important projects involving plates are pending here. Prompt decision is expected on the proposed General Petroleum Co.'s refinery at Ferndale, Wash. Chicago Bridge & Iron Co., Seattle, is low to Water District No. 64, Seattle, for a standpipe involving 60 tons of plates.

Semifinished Steel . . .

Semifinished Prices, Page 162

Pittsburgh—Demand for steel billets has shown some signs of an increase during the third quarter, mainly as a result of the accelerated shell program. Demand for forging quality billets continues at a good rate, and is expected to be maintained as long as automotive demand holds up.

Fontana, Calif.—Kaiser Steel Corp. produced 130,647 tons of steel ingots in March, the greatest monthly output in its history. Kaiser now has nine open hearths in operation.

Los Angeles—Producing 13 per cent of far western steel, plants of

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lehem Pacific Coast Steel Corp. eattle, So. San Francisco and Los eles produced 86,384 tons in ch, highest ever recorded. Rated t capacity of the three plants is 00 net ingot tons per month.

ructural Shapes . . .

Structural Shape Prices, Page 162

ew York—Although there is some rovement in commercial construc-, it fails to make much impression ause of the overwhelming amount public works, particularly bridge struction. The New York State u-way program is taking heavy nage and is featured in particular the award of more than 43,000 tons the Tappan Zee bridge over the dson, off Rockland county. Includ- the 9000 tons of approach work ced several weeks ago, this project taking a total of more than 52,- tons. Largest commercial award this district involves 1200 tons for 9-story apartment on Park avenue. March structural steel bookings ounted to 158,482 tons, a gain 43 per cent over the previous nth and an increase of 32,000 tons r the like month last year, re- rts the American Institute of Steel nstruction. Bookings compared th revised total of 180,882 tons in bruary and 266,944 in January. First quarter bookings totaled 6,208 tons, up 5 per cent over okings in the corresponding period 1952.

Shipments amounted to 266,337 ns in March against a revised ure of 251,136 in February and 1,392 in January. Total first arter shipments of 758,866 tons mpared with 760,185 in the like riod last year.

Backlog as of Mar. 31 amounted 2,155,047 tons against 2,500,946 the end of the first three months last year.

Boston—Any hope of improved sup- y of plain structural material from gular suppliers at nonpremium rices has disappeared for third uarter. Less volume from the Pitts- urgh district is being written off. he eastern Pennsylvania producer annot accept all orders offered and ere is rationing of wide flanged aterial. To meet all requirements r fabricating contracts booked, ops are confronted with the pay- ent of premium and warehouse rices. Backlogs with district shops verage close to three months.

Philadelphia — District structural arket activity is comprised of few w inquiries and virtually no awards 100 tons or more. Some fabricators scribe the situation locally as the llest in a long time despite the fact it is now spring when normally building activity is on the upturn. Fabricators whose normal scope of estimating extends beyond this area report fair business.

Pittsburgh—A slight sag in the market for structurals caused by a diminishing interest on the part of carbuilders is beginning to strengthen itself. Carbuilders are planning for an active third quarter. No immediate price rise is expected in structural extras.

Chicago—For the near term the problem of structural fabricators is to rustle up enough steel to keep shops operating at schedules set. Fabricators wouldn't object, in fact likely would favor, higher mill prices on some types of shapes if such would stimulate output. Competition is getting keen on attractive jobs with price shading becoming more common.

Seattle—Some fabricating plants are idled by a strike of machinists and metal workers. Negotiations were deadlocked last week. Demand for structurals, meanwhile, is active and will increase as more federal projects are released. Due to the short Alaska season it is believed several important construction jobs in that area will have to be deferred to 1954. Two large contracts were awarded last week to Seattle fabricators, 1800 tons for Elmendorf, Alaska, power plant, and 110 tons for the University of Oregon teaching hospital.

Reinforcing Bars . . .

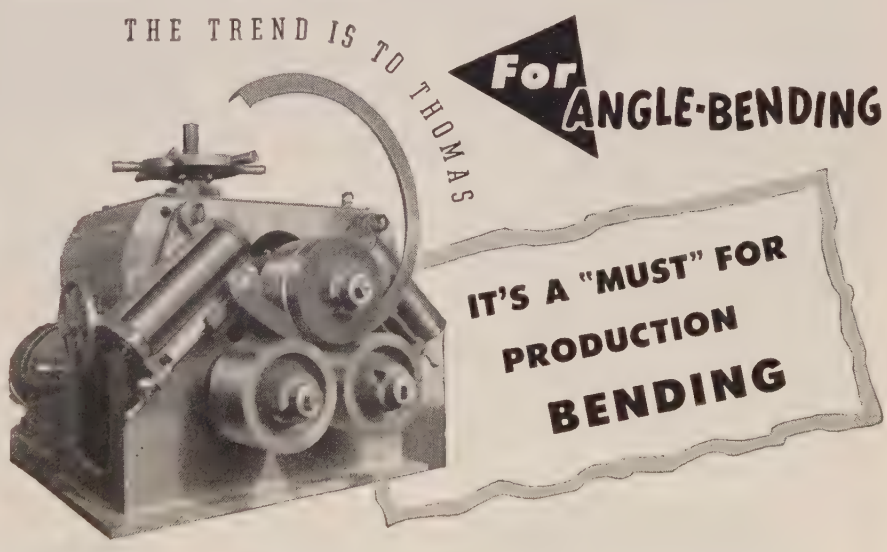
Reinforcing Bar Prices, Page 162

Boston—New extras on reinforcing bars average out to about $5 per ton increase. Changes come at a time when some price shading has developed because of competition.

Largest volume is being placed by district contractors for New York state thruway sections. Several thousand tons are involved in these jobs. Distributors have more tonnage available and fabricating shops are operating near capacity with detailing giving some trouble.

Los Angeles—Shortage of cement, not reinforcing steel, is affecting smaller engineering construction projects. With the biggest building boom in western history shaping up reinforcing bar producers are having little trouble in suplying the demand.

Seattle—Rolling mills here continue to operate at capacity. Order backlogs were reduced recently due to deferment of public works, but with reinstatement of many projects the outlook for summer activity is greatly improved. The strike in the metal



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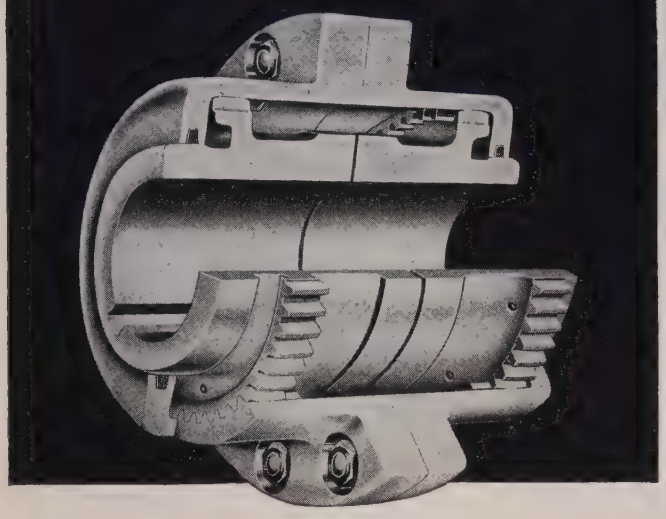

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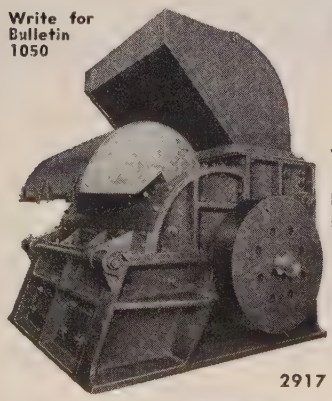

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e in this area is reacting on mill nd as warehouse purchases are icted. Much pending federal involves large tonnages of rein- ng.

Iron . . .

Pig Iron Prices, Page 153

iladelphia—All-rail rates on pig from the Birmingham, Ala., dis- to Delaware river point con- rs, from Wilmington, Del., to ington, N. J., inclusive, are sched- to become effective May 15 at 54 a ton, including 3 per cent ral tax. This will compare with current rate of $17.58, and will e them more competitive with bination rail-water rates. Once official order is released it may lop that Baltimore also will be red by lower all-rail rates from South.

asic iron supply is still tight in area, but this is not the case the foundry grades due, in part, the continued lag in gray iron dry operations.

ack of a marked pickup at the foundries is causing comment in of the advancing spring season. e ascribe the lag to keen compe- n from the southern pipe shops.

oston—Pig iron melt changes lit- with consumption below capacity. rett furnace is stocking some age. Order books with most con- ers do not warrant increase in ntory and buying is barely heavy gh to sustain present stocks.

ew York—Blast furnace produc- of pig iron and ferroalloys set ew monthly record of 6,677,361 tons during March, according to American Iron & Steel Institute. s was 795,843 tons above February put and nearly 113,000 tons more n in January, the previous record th.

irst quarter output was 19,123,262 s, an increase of nearly 1 mil- tons or more than 5 per cent r the first quarter last year. wever, it was 128,000 tons less n in the fourth quarter of 1952. March production was at the rate 99 per cent of capacity, that for quarter at 97.7 per cent.

New York—Pig iron demand is ly steady. Most district foundries w little change in operations, and, ordingly, are not varying their chases of iron much one way or other. There appears to be nty of foundry iron to meet re- rements. Prices continue firm.

Buffalo—Merchant pig iron pro- ers report no trouble finding an let for current supplies as taper- off in general foundry require- nts is offset by sustained demand from auto castings producers and steel mills. The district blast fur- nace operating rate is off 6 points with one merchant stack being shut down for relining.

Cleveland—Merchant iron suppliers are still disposing of all their tonnage without difficulty, but demand pres- sure is noticeably off as compared with a year ago. This reflects con- tinued spotty operations in the found- ry industry, though some foundries are more actively engaged than a few months back, especially those turning out automotive and appliance castings.

Chicago—Foundry activity is im- proving moderately. Automotive de- mand shows no slackening and better production rates are being planned for farm equipment. There is enough iron to meet all needs but inventory building is out of the question. Blast furnace repairs are restricting pro- duction of foundry iron. Of the dis- trict's 43 furnaces 39 are active. United States Steel Corp. blew in its No. 8 unit at Gary Apr. 19 after re- lining, and Youngstown Sheet & Tube Co. took out its No. 2 stack at In- diana Harbor Apr. 14 for relining.

San Francisco—Kaiser Steel Corp.'s third blast furnace, expected to be blown in before the end of June at its Fontana, Calif., plant, will be coming at a time when the metallics situation on the Coast has shown tremendous improvement. Pig iron now is available in certain areas of the Far West at a moment's notice. Columbia-Geneva Steel Division, U. S. Steel Corp., has closed down a blast furnace at Ironton, Utah, because of lack of demand.

Scrap . . .

Scrap Prices, Page 186

Pittsburgh—Outside of a small purchase of No. 2 steel and No. 2 bundles, scrap in the Pittsburgh Dis- trict is not moving. Generally, most grades are being offered at $1 lower than last week.

No. 1 steel has a willing seller at $43 as do both No. 1 bundles and No. 1 busheling. Machine shop turn- ings and mixed borings and turn- ings are offered at $27.50-$28.50, with no great interest evident on the part of consumers. Short shovel turnings and cast iron borings can be had for $32 to $33. Some cut structurals have moved at $48, but it is neg- ligible tonnage.

Heavy turnings are offered at $41 to $42, punchings and plate scrap at $48-$49.

Other price drops: No. 1 cupola to $41 to $42; heavy breakable $40-41; No. 1 machinery $50-$51. Even rail- road scrap is showing the effects of the slack market. Two-ft. rails are at $52-53, offering price; 18-in. and under, $54-$55. Random lengths can be obtained at $48-$49, and special- ties at $51-$52.

Aside from isolated scrap pur- chases where an attractive offer has been made, the present slack market is expected to continue until mill in- ventories become smaller.

Philadelphia — General weakness continues in the scrap market. On limited buying of open-hearth steel, No. 1 heavy melting has been re-

(*Turn to page* 188)

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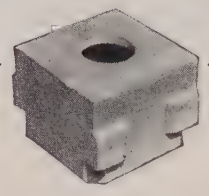
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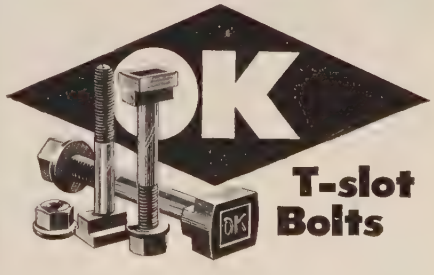

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Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Apr. 30	$41.67
Apr. 23	42.67
Mar. avg.	44.13
Apr., 1952	43.00
Apr., 1948	40.41

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*43.00**
No. 2 heavy melting	39.00-40.00*
No. 1 bundles	*43.00**
No. 2 bundles	35.00-36.00*
No. 1 busheling	*43.00**
Machine shop turnings	*27.50-28.50**
Mixed borings, turnings	*27.50-28.50**
Short shovel turnings	*32.00-33.00**
Cast iron borings	*32.00-33.00**
Cut structurals	*48.00**
Heavy turnings	*41.00-42.00**
Punchings & plate scrap	*48.00-49.00**
Electric furnace bundles	46.00*

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Charging box cast	44.00-45.00
Heavy breakable cast	*40.00-41.00*
Unstripped motor blocks	40.00-41.00
No. 1 machinery cast	*50.00-51.00*

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
Rails, 2-ft. and under	*52.00-53.00*
Rails, 18-in. and under	*54.00-55.00*
Rails, random lengths	*48.00-49.00*
Railroad specialties	*51.00-52.00*

*Plus applicable freight springboards from other areas.

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*41.00-41.50**
No. 2 heavy melting	*35.00-36.00**
No. 1 bundles	*41.00-41.50**
No. 2 bundles	*33.00-34.00**
No. 1 busheling	*41.00-42.00*
Machine shop turnings	*21.00-22.00*
Mixed borings, turnings	*29.00-30.00*
Short shovel turnings	*29.00-30.00*
Cast iron borings	*29.00-30.00*
Low phos., electric furn.	*46.00-47.00*
Low phos., foundry	*49.00-51.00*
Alloy free, short shovel turnings	*31.00-32.00*
Electric furnace bundles	*43.50-44.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Charging box cast	45.00-46.00
Stove plate	45.00-46.00
Heavy breakable cast	*40.00-41.00*
Unstripped motor blocks	*28.00-29.00*
Brake shoes	40.00-41.00
Clean auto cast	51.00-52.00
No. 1 wheels	*41.00-42.00*
Burnt cast	*38.00-39.00*
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	*46.00-47.00*
R. R. Malleable	*49.00-50.00*
Rails, 3-ft. and under	58.00-60.00
Rails, 18-in. and under	61.00-62.00
Rails, random lengths	*53.00-54.00*
Cast steel	*49.00-50.00*
Railroad specialties	*51.00-52.00*
Uncut tires	*50.00-51.00*
Angles, splice bars	54.00-55.00
Rails, rerolling	*53.00-54.00*

*Plus applicable freight springboards from other areas not to exceed $4.

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*43.00-44.00**
No. 2 heavy melting	*36.00-37.00**
No. 1 bundles	*43.00-44.00**
No. 2 bundles	*33.00-34.00**
Machine shop turnings	*22.00-23.00*
Short shovel turnings	*29.00-30.00*
Cast iron borings	*30.00-31.00*
Low phos.	48.00-49.00*
Electric furnace bundles	45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

*Plus applicable freight springboards from other districts not to exceed $4.

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*42.00-43.00*
No. 2 heavy melting	*38.00-39.00*
No. 1 bundles	*42.00-43.00*
No. 2 bundles	*33.00-34.00**
No. 1 busheling	*42.00-43.00*
Machine shop turnings	*28.00-29.00*
Mixed borings, turnings	*32.00-33.00*
Short shovel turnings	*33.00-34.00*
Structurals & Plate	*45.50-46.00*
Heavy turnings	*39.50-40.50*
Couplers, springs, wheels	*50.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Charging box cast	*41.00-42.00*
Heavy breakable cast	*43.00-44.00**
Unstripped motor blocks	*31.00-32.00*
Drop broken machinery	*47.00-48.00*

*Nominal

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*30.00*
No. 2 bundles	*26.00*
Machine shop turnings	20.50-21.00
Mixed borings, short turnings	23.50-24.00
Low phos. (structural & plate)	*38.00-39.00*
Shovel turnings	23.50-24.00

Cast Iron Grades

No. 1 cupola	*34.00*
Unstripped motor blocks	*23.00-24.00*

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	*32.00**
No. 2 heavy melting	*29.00-30.00**
No. 1 bundles	*32.00**
No. 2 bundles	*28.00-29.00**
Machine shop turnings	*19.17**
Mixed borings, turnings	*19.17**
Short shovel turnings	*23.17**
No. 1 cast	34.00-35.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	46.00-47.00

*Nominal.

DETROIT

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	34.50-35.00
No. 1 bundles	40.00-41.00
No. 2 bundles	*28.00-29.00*
No. 1 busheling	40.00-41.00
Machine shop turnings	*20.50-21.00*
Mixed borings, turnings	22.00-22.50
Short shovel turnings	22.00-22.50
Punchings & plate scrap	42.00-43.00

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	40.00-42.00
Stove plate	43.00-44.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	*49.00*
Malleable	48.00

CINCINNATI

(Delivered consumer plant)

No. 1 heavy melting	*41.50*
No. 2 heavy melting	*37.50*
No. 1 bundles	*41.50*
No. 2 bundles	*35.00*
No. 1 busheling	*41.50*
Machine shop turnings	*27.00*
Mixed borings, turnings	*28.00**
Short shovel turnings	*28.00**
Cast iron borings	*28.00**

Cast Iron Grades

No. 1 cupola	*44.00*
Charging box cast	40.00
Stove plate	*34.00**
Burnt cast	*33.00**
Heavy breakable cast	*37.00**
Unstripped motor blocks	*30.00*
Brake shoe	*34.00**
Clean auto cast	43.00
Drop broken machinery	*48.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00*
Malleable	46.00
Rails, 18-in. and under	*57.00*
Rails, random lengths	*48.00*
Rails, rerolling	52.00

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting	*39.00-40.00**
No. 2 heavy melting	*37.00-38.00**
No. 1 bundles	*42.00-43.00**
No. 2 bundles	*34.00-35.00**
No. 1 busheling	*39.00-40.00**
Machine shop turnings	*21.00-22.00**
Mixed borings, turnings	*21.00-22.00**
Short shovel turnings	*22.00-24.00**
Cast iron borings	*21.00-22.00**
Cut structurals	46.00-47.00*
Electric furnace bundles	45.00-46.00*

Cast Iron Grades

No. 1 cupola	42.00-43.00
Stove plate	38.00-40.00
Unstripped motor blocks	38.00-40.00
Clean auto cast	46.00-48.00
Drop broken machinery	45.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-47.00
R.R. Malleable	45.00-47.00
Rails, 2-ft. and under	*52.00-54.00*
Rails, 18-in. and under	*54.00-56.00*
Angles, splice bars	52.00-54.00
Rails, rerolling	50.00-53.00

*Plus applicable freight springboards from other areas.

BIRMINGHAM

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	33.00-34.00
No. 1 bundles	37.00-38.00
No. 2 bundles	31.00-32.00
No. 2 busheling	35.00-36.00
Machine shop turnings	26.00-27.00
Mixed borings, turnings	31.00-32.00
Short shovel turnings	28.00-29.00
Cast Iron borings	28.00-29.00
Cut structurals	41.00-42.50
Heavy turnings	38.00
Punchings & plate scrap	41.00-41.50
Electric furnace bundles	37.00-38.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00-41.00
Charging box cast	30.00-31.00
Stove plate	36.50-37.50
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	46.00-47.00
Burnt cast	41.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Malleable	nom.
Rails, 2-ft. and under	46.00-47.00
Rails, 18 in. and under	46.00-47.00
Rails, random lengths	42.00-43.00
Cast steel	44.00
Uncut tires	43.00
Angles, splice bars	46.00-47.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting	37.00
No. 2 heavy melting	37.00
No. 1 bundles	40.00
No. 2 bundles	37.00
Machine shop turnings	25.00-26.00
Short shovel turnings	27.00-28.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Heavy breakable cast	32.00-34.00
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	44.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	38.00-40.00
Rails, 18-inch and under	55.00-56.00
Rails, random lengths	39.00-40.00
Uncut tires	46.00
Angles, splice bars	48.00-49.00
Rails, rerolling	48.00-50.00

BUFFALO

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*38.00-39.00*
No. 2 bundles	*37.00-38.00*
No. 1 bundles	*42.00-43.00*
No. 1 busheling	*42.00-43.00*
Machine shop turnings	*25.00-26.00*
Mixed borings, turnings	*28.00-29.00*
Short shovel turnings	*28.00-29.00*
Low phos.	*45.00-46.00*

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	*40.50-41.50*
No. 1 machinery	*44.50-45.00*

Railroad Scrap

Rails, random lengths	*46.00-47.00*
Rails, 2 ft and under	*52.00-53.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	32.00
No. 2 bundles	26.00
No. 3 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Short shovel turnings	15.00
Electric furnace, No. 1	40.00-41.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	29.00
No. 1 wheels	38.00-40.00

Railroad Scrap

Rails, random lengths	38.00

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 busheling	30.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	4000
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Malleable	55.00
Rails, 3-ft. and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	24.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	38.00-41.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt.	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	31.50
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	28.50
Rails, Remelting	35.50
Rails, Rerolling	38.50
Busheling	28.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	28.50

Cast Iron Grades

No. 1 Machinery Cast	50.00

† F.o.b., shipping point.

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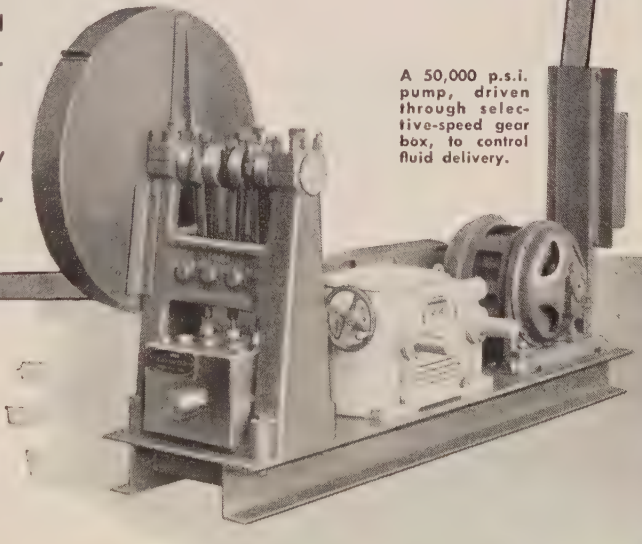

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126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Scrap . . .

(*Continued from page* 185)

duced to $42 to $43, No. 2 heavy melting to $38 to $39, and No. 1 bundles and No. 1 busheling to $42 to $43. No. 2 bundles are particularly weak, with little or no trading and the market nominal at $33 to $34 delivered.

Machine shop turnings are down to $28 to $29, mixed borings and turnings to $32 to $33, and short shovel turnings to $33 to $34. Weakness in low phos structurals and plate is reflected in a spread of $45.50 to $46. Heavy turnings are lower at $39.50 to $40.50, and couplers, springs and wheels at $50.

Cast grades are definitely easier, reflecting continued lag in gray iron foundry operations. No. 1 cupola cast is now $39 to $40 delivered, charging box cast $41 to $42, heavy breakable cast nominally $43 to $44, unstripped motor blocks $31 to $32 and drop broken machinery $47 to $48.

New York—Scrap brokers' buying prices have been reduced again on most items. Business is light with collections gradually drying up. Brokers are now offering to pay $35 to $36 for No. 1 heavy melting, $30 for No. 2 heavy melting, and around $26 for No. 2 bundles, with almost too little business in the latter to establish a market. Prices on low phos structural and plate have been reduced to $38 to $39, and on No. 1 cupola to $34, unstripped motor blocks to $23 to $24. Machine shop turnings, mixed borings and turnings and shovel turnings are unchanged.

Buffalo—Scrap dealers say they will not be surprised if prices decline $4 to $5 a ton when the leading mill places orders for delivery in June. To some extent the easiness here reflects weakness in the market at other consuming points. The softer tone is augmented by increased supplies and expanding receipts by water. Buying of cast grades is virtually nil.

Cleveland—General decline in scrap prices in this area reflects weakness induced by continued niggardly buying by mills and foundries.

With mill stocks apparently adequate for the immediate future, and uncertainty prevailing with respect to continued uninterrupted high-level operations because of pending steel wage negotiation, the mills are taking in only limited tonnage from dealers, and much of this is being rejected.

As a result, dealer scrap prices are turning downward so rapidly it is difficult to determine representative market quotations because of the diversity of views among the various market factors. Generally, $41 to $41.50 appears to be the prevailing price on No. 1 heavy melting at the moment, but some interests think the market is even lower at $39.50 to $40. The No. 2 grades are particularly weak, being off as much as $5 per ton from a week ago.

The better cast grades are moving but prices on several are down from a week ago, notably heavy breakable now quoted $40 to $41, unstripped motor blocks at $28 to $29, and burnt cast at $38 to $39.

Railroad grades also are lower with No. 1 railroad $46 to $47, malleable, $49 to $50 and rails, random lengths, $53 to $54.

Detroit—Observers here feel that the market in turnings which has been soft for the past month is beginning to show signs of stabilizing and that scrap prices generally are reaching realistic levels.

Cincinnati—The scrap market shows signs of easiness with scarcely enough buying being done to establish a market. Quoted prices are off several dollars a ton, largely representing dealers' ideas of the market rather than reflecting actual sales.

Chicago—Complexion of the scrap market here was changed only slightly when an important mill made its anticipated purchase last week. Prices paid were essentially those which were prevailing, namely $40 for No. 1 heavy melting and $43 for No. 1 bundles. Subsequent buying by another user dropped No. 2 heavy melting by $1 a ton to $37. Acquisitions are not large because of heavy inventories. Turnings and borings are off $2 per ton. Cast grades continue sluggish with trading light.

St. Louis—Scrap market activity is near a record low in all grades. Mills are heavily stocked and expect prices to drop. Country sources are drying up as truckers turn to more remunerative hauling. What little mill buying occurs is in driblets. The district's biggest consumer is out of the market and holding up deliveries scheduled to start early in April. May deliveries are embargoed until further notice. Heavy tonnages are backing up in dealers' yards. Brokers' quotations are unchanged due to scarcity of sales, but Laclede Steel is known to have bought small quantities of No. 2 steel and No. 2 bundles at well under posted prices.

San Francisco—No. 1 cupola cast held at $40 a ton last week, culminating a three weeks' rise which has brought it up $2.50 a ton. Steelmaking grades were unchanged with the market lethargic despite the fact mill consumption is high.

Seattle—Scrap is plentiful but the price structure is unchanged. Buyers

CLASSIFIED

Positions Wanted

EXECUTIVE EXPERIENCED AS PLANT MANAGER with cost and production experience. Sound industrial background in administrative and management functions. 25 years' experience. B.S. Degrees M.I.T. Write Box 693, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Qualified by successful record in all phases of plant operation: engineering, production, tooling, methods, incentive, cost, controls, personnel. Steel fabrication, machining, machinery construction, pressure vessels. Write Box 720, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Hoppers, Twin, All-Steel, 50-Ton, *Cross Dump*
Ore Hoppers, All-Steel, 50-Ton, Heavy Duty
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All-Steel, 70-ton, Triple Hopper Cross Dump

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2⅝ x 1⅝ x ¼"	43700 #
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3 x 3 x ⅜	24000
CHANNELS	
7⅞–17.5 #	47250 #
I BEAMS	
6"–12½ #	9000 #
TEES	
2 x 2 x ¼	7300 #
2½ x 2½ x ¼	9000
2½ x 2½ x 5/16	12000
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are more discriminating and this policy has resulted in higher grades coming to market. No foreign scrap is being shipped in this area, the adjacent territory furnishing sufficient materials to meet demand. Inventories are rising and buyers are in comfortable stock position. Cast iron scrap supply exceeds demand.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 181

Chicago—Foundry coke reflects better production of castings. For the past 60 days coke output has been fully absorbed by consumers and there is no indication that inventories are mounting beyond good working quantities. Prospects look promising as far as midyear at least.

San Francisco—Ninety additional coke ovens to be brought into operation by Kaiser Steel Corp. at its Fontana, Calif., steel plant, before the end of June will balance out the company's coke facilities and eliminate the neccessity of outside purchases.

Clevland—Some slight improvement in consumption of oven coke is noted here, reflecting pickup in activity at some foundries, but overall the market is unchanged from that of recent weeks.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

43,207 tons, Tappan Zee bridge, over the Hudson, for New York State Thruway Commission, to American Bridge Division, United States Steel Corp., Pittsburgh. This is in addition to 9000 tons of approach work, placed earlier in the year with the same fabricator.

4900 tons, Boettcher Center office building, Denver, through George A. Fuller Co., New York to Bethlehem Steel Co., Bethlehem, Pa.

2800 tons, Denver Club office building, Denver, to Burkhardt Steel Co., Denver.

2300 tons, maintenance hangar, air field base, Bunker Hill Inc., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1800 tons, Elmendorf, Alaska, air base powerhouse, to Isaacson Iron Works, Seattle; Patti-MacDonald Construction Co., general contractor.

1200 tons, 19-story apartment, Phillip Lipstein, 65th St. and Park Ave., New York, to American Bridge Division, United States Steel Corp., Pittsburgh.

1100 tons, hospital, University of Oregon, Portland, to Bethlehem Pacific Coast Steel Corp., Seattle; Donald M. Drake, Portland, Oreg., general contractor.

600 tons, addition to Manufacturers Trust Co. building, 5th Ave. and 43rd St., New York, to Ingalls Iron Works Co., Birmingham, Ala., through George A. Fuller Co., New York.

575 tons, Washington state Skagit river bridge, to Poole, McGonigle & Dick, Portland, Oreg.; Guy F. Atkinson & Co., Seattle, general contractor, low $1,033,464.

550 tons, extension to City Hospital, Wards Island, New York, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, plant, Allied Chemical & Dye Corp., in Michigan, to Vierling Steel Works, Chicago.

180 tons, Sunnyside, Wash., junior high school, to Isaacson Iron Works, Seattle.

150 tons, office and warehouse, Chicago Musical Instrument Co., Chicago, to Vierling Steel Works, Chicago.

120 tons, bridge, Portland, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.

116 tons, State Thruway bridge, Bronx county, New York, to Phoenix Bridge Co., Phoenixville, Pa.

115 tons, powerhouse, Crown-Zellerbach Paper Co., Port Angeles, Wash., to Isaacson Iron Works, Seattle.

100 tons, draft tube gantry crane, Chief Joseph dam, to Star Iron & Steel Co., Tacoma, Wash., $42,930, U. S. Engineer, Seattle.

Unstated, intake gates, operating machinery, Chief Joseph dam, to Willamette Iron & Steel Co., Portland, Oreg., low $218,428 by U. S. Engineer, Seattle.

STRUCTURAL STEEL PENDING

3200 tons, bomber hangar, air base, Limestone, Me.; bids in late May.

1980 tons, state thruway bridge, Orange county, New York; bids May 7.

1100 tons, state thruway bridge, Bronx county, New York; bids May 7.

450 tons, also 55 tons reinforcing bars, 3-span, plate girder bridge, Snake river, near Alpine, Wyo.; bids to Bureau of Reclamation, Palisades, Idaho, May 19.

300 tons, building for Port of New York Authority, Idlewild Airport, Long Island; bids asked.

270 tons, high school, Curwensville, Clearfield county, Pa.; bids asked.

190 tons, DuPont plant addition, Dumbarton, S. C.; bids May 5.

100 tons, central heating unit, air field, Dover, Del., pending.

Unstated, two warehouses, Elmendorf Field, Alaska; Birch, Lytle, Green, Seattle, apparently low, $1,419,465, to U. S. Engineer, Anchorage, Alaska.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, Ballard General Hospital, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; general contract bids May 14.

220 tons, Washington state Skagit river bridge to Bethlehem Pacific Coast Steel Corp., Seattle; Guy F. Atkinson Co., Seattle, general contractor.

150 tons, Ladd Field, Alaska, laundry plant, to Bethlehem Pacific Coast Steel Corp., Seattle; Birch, Lytle, Green, Seattle, general contractors.

150 tons, operations building, Ault Field, Washington state, to Northwest Steel Rolling Mills Inc., Seattle; Halvorsen Co., Seattle, general contractor.

REINFORCING BARS PENDING

500 tons, Garden State parkway, contract 25, section 7, Monmouth county, New Jersey; bids May 14.

455 tons, Corps of Engineers, Pittsburgh; bids in.

389 tons, Garden State parkway, contract 41, section 7, Monmouth county; bids May 14.

PLATES . . .

PLATES PENDING

725 tons, hull plates, Corps of Engineers, Pittsburgh; bids in.

PIPE . . .

CAST IRON PIPE PENDING

1000 tons, Hillsboro, Oreg; expansion; bids in.

200 tons, system expansion; bids in to Shelton, Wash.

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Bangor & Aroostook, 2 sleepers, to Worcester, Mass., plant of Pullman-Standard Car Mfg. Co., Chicago.

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Southern, 250 ninety-five-ton gondolas to Pullman-Standard Car Mfg. Co., Chicago.

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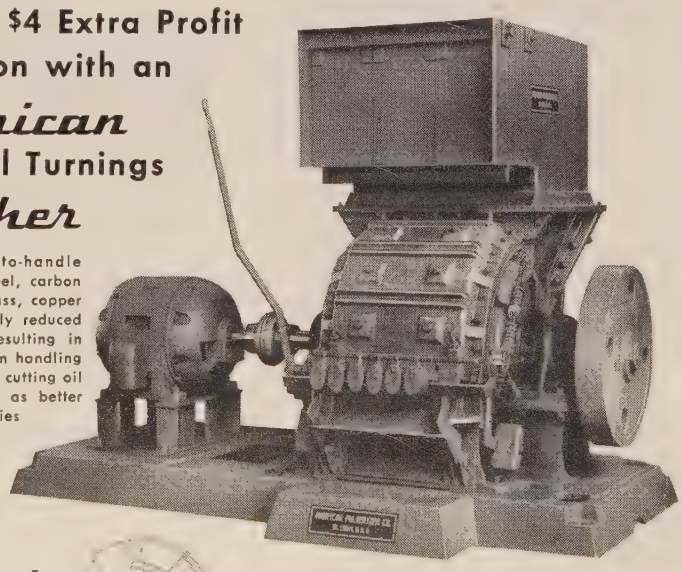

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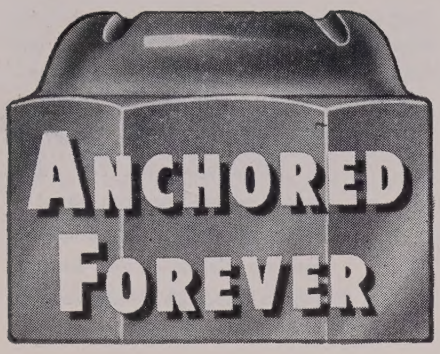

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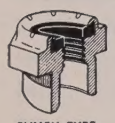
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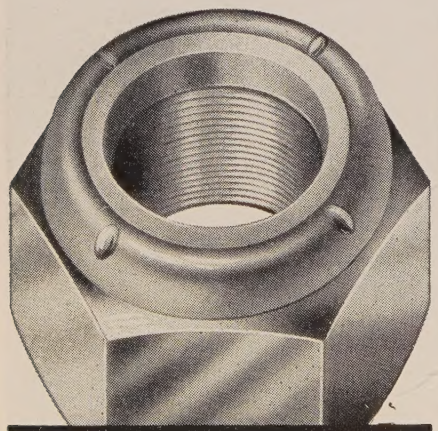

GREER Stop Nuts

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FARVAL—*Studies in Centralized Lubrication* No. 142

FARVAL SAVES DOLLARS

and many production hours on 4 Minster presses

THE press room is the bottleneck in any sheet metal plant. If presses are shut down for oiling or repair of bearings due to faulty lubrication, the entire manufacturing operation grinds to a halt. Production is lost.

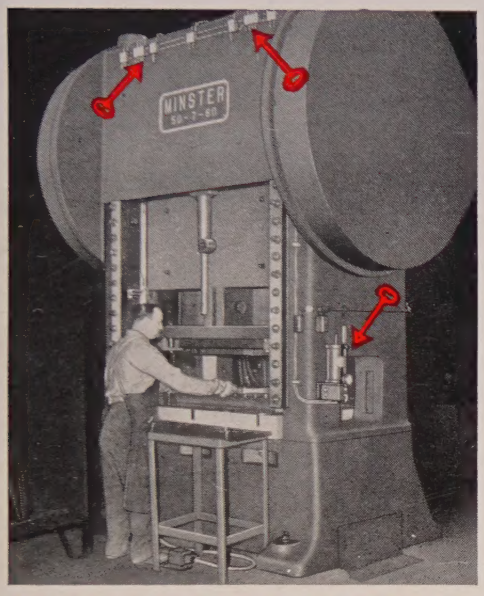
To avoid these troubles in its plant, Lyon Metal Products, Inc. installed Farval centralized systems of lubrication on their four Minster presses. The results were immediate: Farval resulted in considerable savings in labor and lubricant over a three-year period. But better than that, Farval freed these presses for their real work of high-speed, non-stop production by eliminating the "human element" involved in frequent shutdowns for lubrication. Now, with a quick stroke, all points (regardless of location) on a machine are lubricated properly, effortlessly. In addition, the Farval system is sealed against dust and scale which inevitably get into bearings with old-fashioned oiling methods.

Farval is the original Dualine system of centralized lubrication that delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble.

Today, Farval is working in hundreds of metalworking and processing shops protecting bearings on presses, coilers, shears—in fact, every type of equipment that must be lubricated regularly and properly.

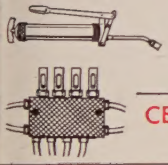
If you want to lower production costs in your plant, you owe it to yourself to look into Farval. The savings will amaze you. Write today for free Bulletin 25. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



KEYS TO ADEQUATE LUBRICATION— Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know that a machine will be properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.

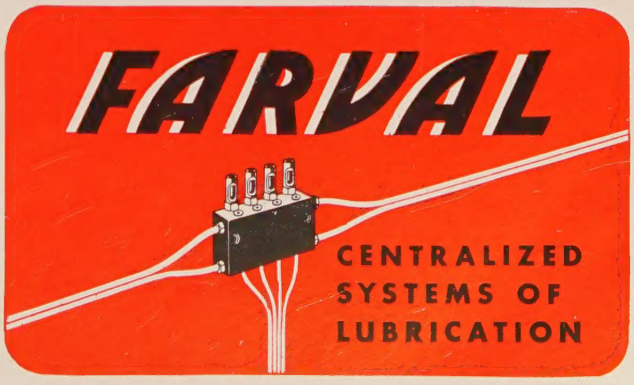
FARVAL SAVES ON LUBRICATING 4 PRESSES
(Savings based on one work shift per day)

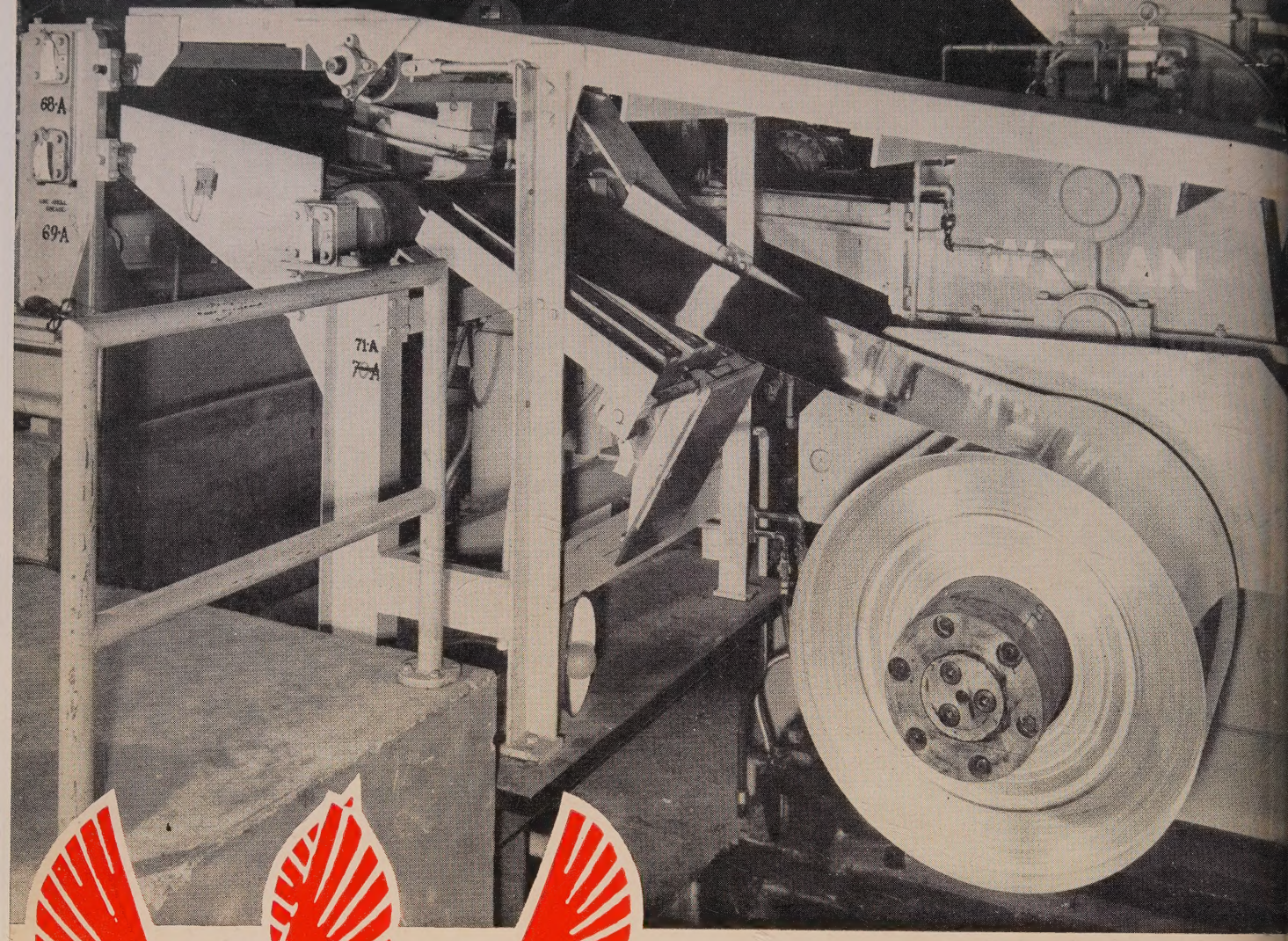


	Lbs./Yr. lube. 64 points	Hrs./Yr. lube. 64 points
GREASE GUN	576 lbs.	208 hrs.
CENTRALIZED SYSTEM	144 lbs.	52 hrs.
SAVINGS EFFECTED IN 3 YEARS BY FARVAL	1296 lbs.	468 hrs.

AND IN ADDITION, FARVAL SAVES BEARING EXPENSE AND PRODUCTION TIME

ports of lubrication engineers show lubrication by grease gun takes .747 nutes per point to clean dirt from nipples, grease, move from point to int and refill gun. With Farval it only takes .188 minutes per point to fill ervoir, build up and hold pressure, and lubricate. In addition, Farval ves 3 pounds of each 4 of lubricant used by other methods.

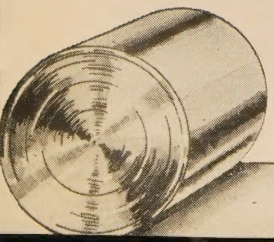




WEAN

electrolytic tinning

The Wean Engineering Company is meeting today's demands for equipment to produce tin plate and zinc coated strip steel with light coatings by the electrolytic method; also equipment to produce chemically treated black plate and strip steel. Equipment for coating strip steel with zinc and other materials by the hot dip method is also available.



The WEAN ENGINEERING COMPANY, INC.

WARREN, OHIO

SPECIALISTS IN SHEET, TIN, AND STRIP MILL EQUIPMENT